

BIOTERRORISM INFORMATION HANDBOOK FOR CLINICIANS



Metropolitan Medical Response System
MMRS

Sedgwick County Health Department
1900 East 9th Street
Wichita, Kansas 67214



January 2003

Acknowledgements

The Sedgwick County Health Department would like to thank the following organizations and individuals for their contribution to this handbook:

The **Santa Clara County Public Health Department**, San Jose, CA, for the use of their “Zebra Packet: Bioterrorism Information for Clinicians” handbook which served as a guide and information source for the assembly of our own handbook.

This handbook is a response to a request by The Medical Society of Sedgwick County EMS Advisory Subcommittee for Disaster Preparedness Physicians. The intent of the Guide is to best assure medical and health care providers a concise up-to-date resource for educational and response actions. Knowing there is one common source available to medical and health care providers in the area, can increase effectiveness of medical measures. Also, it will facilitate collaborative dialogue between staff members of different organizations--when they have a common source to refer to. The Guide has local and state information including flow charts and templates.

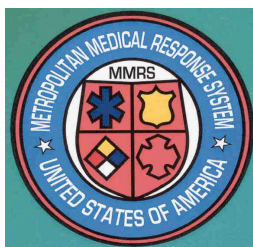
Preface - A great deal of attention and effort has been focused toward the nation's ability to response to the crippling consequences of a biological incident. It is fair to say the medical community nationwide and in Sedgwick County has been involved with hours of planning, preparedness and training, and mitigation activities since September 11, 2001. The reality is, a public health emergency involving mass casualties can be best survived if there is a “Community Response” effort. Hospitals, Clinics, Health Departments, and First Responder agencies must take the lead in that event.

MMRS Mission – “A community response to manage the health consequences of a mass casualty event.”



Sedgwick County
**Health
Department**

1900 East Ninth, Wichita, KS 67214



**Metropolitan Medical Response System
24 Hour Pager 579-1920
Information for Clinicians**

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Effective January 2003- Updates to BioTerrorism Handbook Made- This document is subject to additions and revisions on an ongoing basis. Sedgwick County Health Department will make an effort to keep all information up-to-date and distributed. Please visit Sedgwick County's Metropolitan Medical Response System (MMRS) Website at: <http://sedgwickcounty.org/mmrs/index.html> for updated information to the Bioterrorism Handbook and other MMRS program updates.

Section V - Update Information

1. Notice to Readers: Use of Anthrax Vaccine in Response to Terrorism: Supplemental Recommendations of the Advisory Committee on Immunization Practices (ACIP), p. 33
2. Reference additions: Bozzette, S., et al. A Model for a Smallpox Vaccination Policy, N Engl J Med 2003; 348;5, Smallpox websites, pp. 94

Section VI.- Addendum

- A. Kansas Department of Health and Environment (KDHE)- Guidelines for Management of a Suspect Case of Smallpox in Acute Care Medical Settings in Kansas, pp. 90 **(PDF)**



Detecting Bioterrorism The Clinician's Role and Responsibility

“Community Response to a Catastrophic Mass Casualty Incident”

Sedgwick County Metropolitan Medical Response System (MMRS)

MMRS

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Date: July 2002
RE: Recognizing Bioterrorism Agents

Health care providers will be the “first responders” in the event of a BT attack or, with other public health events. It is critical that physicians and other clinicians participate in astute early detection and rapid notification processes to get an effective response started in our community.

Syndromic surveillance includes patient(s) with the following clinical syndromes:

1. Acute or severe pneumonia or respiratory distress
2. Encephalopathy
3. Acute onset neuromuscular symptoms
4. Otherwise unexplained rash with fever
5. Fever with mucous membrane bleeding
6. Unexplained acute icteric syndromes
7. Massive diarrhea with dehydration and collapse

Considerations:

- Atypical host characteristics:
 - Young (<50 years)
 - Immunologically intact
 - No underlying illness
 - No recent international travel or other exposure
- Serious unexpected acute illness
 - Abrupt onset
 - Prostration
 - Cardiovascular collapse
 - Respirator distress
 - Obtundation/change in mental status
 - Disseminated intravascular coagulation
 - Rapidly declining status (changing before your eyes)
- Multiple similarly presenting cases
 - Geographically associated or clustered
 - Common place, time, area or potential exposure
- Increases in common syndromes occurring out of season
 - Influenza like-illness in the summer

Most Important, is there current prevalence of a BT related case in the U.S.A, Kansas, surrounding area?

This packet resource is for educational and reference purposes. It contains local, state and federal sources.

Sedgwick County Health Department - MMRS

**REPORTABLE DISEASES IN KANSAS for health care providers, hospitals, and laboratories
(K.S.A 65-118, 65-128, 65-6001 through 65-6007, K.A.R. 28-1-2, 28-1-18)**

Suspected or Confirmed cases of the following must be immediately reported to Sedgwick County Health Department at **pager number 316-579-1920** and to KDHE: **1-877-427-7317**.

Anthrax
Botulism
Cholera
Measles (rubeola)
Meningitis, bacterial

Meningococemia*
Mumps
Pertussis (whooping cough)

Plague
Poliomyelitis
Q Fever
Rabies, human and animal
Rubella, including congenital rubella syndrome
Smallpox
Tuberculosis*
Viral hemorrhagic fever

Fax reports of the following diseases to the Sedgwick County Health Department at **316-267-2583** and to KDHE - BEDP – Epidemiologic Services Section: **1-877-427-7318**.

Acquired Immune Deficiency Syndrome (AIDS)
Amebiasis
Brucellosis
Campylobacter infections
Chancroid
Chlamydia trachomatis genital infection
Cryptosporidiosis
Diphtheria
Ehrlichiosis
Encephalitis, infectious
Escherichia coli O157:H7 and other enterohemorrhagic, enteropathogenic and enteroinvasive *E. coli* *

Giardiasis
Gonorrhea
Haemophilus influenza, invasive disease
Hantavirus Pulmonary Syndrome
Hemolytic uremic syndrome, postdiarrheal
Hepatitis, viral (acute and chronic)
Human Immunodeficiency Virus (HIV)

Legionellosis
Leprosy (Hansen disease)
Listeriosis
Lyme disease
Malaria
Psittacosis
Rocky Mountain Spotted Fever
Salmonellosis, including typhoid fever *
Shigellosis *
Streptococcal invasive disease, Group A
*Streptococcus or Staphylococcal pneumonia**
Syphilis, including congenital syphilis
Tetanus
Toxic shock syndrome, streptococcal and staphylococcal
Trichinosis
Tularemia
Varicella (chickenpox) deaths
Yellow fever

* Isolates must be sent to: Division of Health and Environmental Laboratories, Kansas Department of Health and Environment, Forbes Field, Building #740, Topeka, KS 66620-0001, (785) 296-1636.

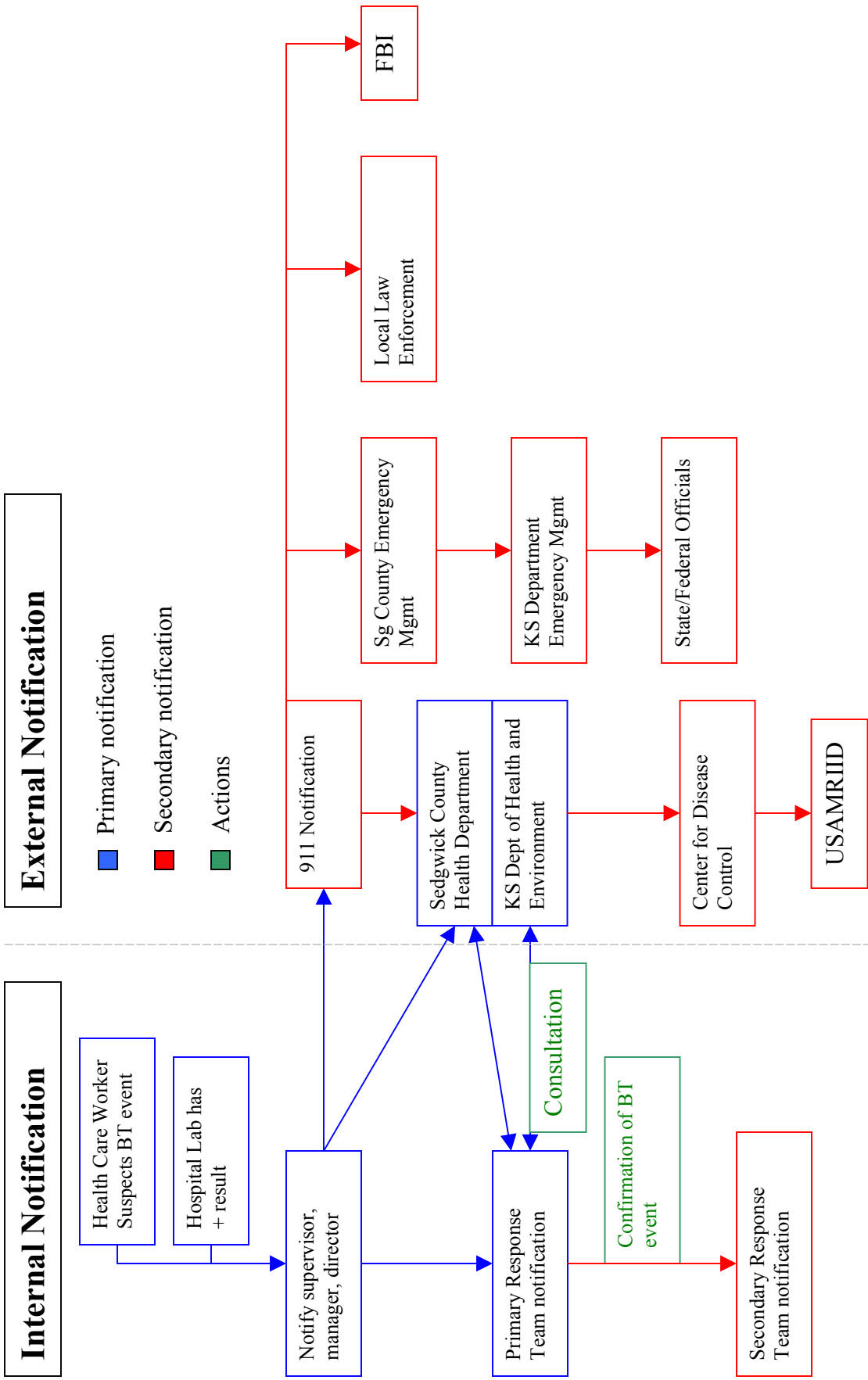
Outbreaks, unusual occurrence of any disease, exotic or newly recognized diseases, and suspect acts of terrorism should be immediately reported by telephone: 1-877-427-7317 (toll free).

In addition, laboratories must report:

Blood lead level (≥ 10 ug/dl for children < 18 years; ≥ 25 ug/dl for persons ≥ 18 years)
CD4+ T-lymphocyte count < 500 / ul or CD4+ T-lymphocytes $< 29\%$ of total lymphocytes

For more information contact the Sedgwick County Health Department or call KDHE, Bureau of Epidemiology and Disease Prevention at: 785-296-2951.

Hospital – Clinic Notification Flow Sheet for Terrorism Incident



BT Response External Communication

Chain of External Communication

- ❑ Hospital – Clinic notifies 911, Sedgwick County Health Department, KDHE, (and Hospital Lab notifies KDHE Lab)
 - “This call is from (name of facility) it is to notify of a potential terrorism related case”.
 - Give name of caller, brief details: who, what, where, when
 - Respond to questions from 911, SCHD or KDHE
 - Request to know who will follow-up to the call and when
- ❑ 911 notifies Sedgwick County Health Department–SCHD notifies other hospitals and KDHE
- ❑ 911 notifies Local Law Enforcement and the FBI
- ❑ 911 notifies Sedgwick County Department of Emergency Management (SCDEM), public safety and city/county officials
- ❑ SCDEM notifies Kansas Department of Emergency Management (KDEM)
- ❑ KDEM notifies other State and Federal agencies/officials
- ❑ KDHE notifies Centers for Disease Control and Prevention (CDC) (707-488-7100)
- ❑ CDC notifies USAMRIID (301-619-2833)

AGENCY	MAIN TELEPHONE	CELL PHONE	PAGER NUMBER	FAX
SCHD Business Hours	316-990-7706	316-990-7706	579-1920	316-267-2583
SCHD After Hours / Weekends	316-990-9460		24 Hour Pager 579-1920	316-267-2583
KDHE 24 Hour Hotline	877-427-7317			
Wesley Medical Center	316-688-3030	NA	NA	316-688-7405
Via-Christi St. Francis	316-268-8050			316-291-7891
Via-Christi St. Joseph	316-689-5004			316-689-4733
Via-Christi Riverside	316-946-8601	316-806-5662	316-261-2741	316-946-5237
VA Medical Center	316-685-2221		316-466-1474	316-634-3001
Wichita Clinic - Main	316-689-9111			
KDHE Lab				
Local Emergency	911			
Law Enforcement	911			
Fire Depts.	911			
EMSS	911			
SCDEM	911			
Local FBI Office	262-0031			

NOTE: Enter appropriate numbers and keep updated. All telephone, pager, cell, and fax numbers subject to change

Internal Hospital BT Response Team Notification

Primary BT Response Team	Name	Office Number	Cell/Beeper Number	Home Phone
Chief Executive Officer (CEO)				
Chief Operations Officer (COO)				
Chief Financial Officer (CFO)				
Chief Nursing Officer (CNO)				
Nursing Supervisor, AND				
Chair, Infection Control Committee				
Infection Control Practitioner				
Security/Safety Officer				
Public Information Officer				
Others:				

Secondary BT Response Team	Name	Office Number	Cell/Beeper Number	Home Phone
Pharmacy				
Laboratory/Pathology				
Emergency				
Critical Care				
Admission, Transfer & Discharge				
Public Relations				
Materials Management				
Facilities Management				
Social Services				
Security				

*** Note: Please keep all names, numbers, and email addresses current**

COMMUNICATIONS AND NOTIFICATION PROCEDURE

Internal Notifications

A bioterrorist (BT) incident could be suspected by a clinic/hospital personnel including: physicians, staff nurses, lab technicians, radiologists, infection control (IC) personnel, or other health care workers (HCW). The first person suspecting a BT incident should immediately notify their direct supervisor, department manager, or director. If no direct supervisor is available (after hours, weekends, etc) then the suspecting HCW should contact the nursing supervisor or house supervisor, or another administrator. Either the suspecting HCW or the supervisor should then contact a member of the hospital's Primary Response Team (hospital administrator, infection control, hospital epidemiologist, etc). The supervisor or administrator should then take responsibility for contacting all internal members of the Primary Investigation Team (PIT) (see notification form). The supervisor or administrator should also contact 911 the local health department and other agencies to begin coordination of efforts.

The goal of the Primary Response Team is to communicate credible information about a possible BT incident to the Sedgwick County Health Department (SCHD) and the Kansas Department of Health and Environment (KDHE) within two hours of the initial suspicion. IC should develop a tentative case definition in consultation with the PIT. The medical records of patient(s) with similar symptoms currently seeking treatment should be reviewed and the clinical information documented. This information may assist the SCHD in determining if the incident is BT related or due to a clinical syndrome occurring concurrently in the community. If a BT incident is suspected after discussion with the PIT, a leader should be designated to communicate with the SCHD. All recommendations of the SCHD should be documented and discussed with the PIT.

Confirmation that a BT incident has taken place will require consultation with local, state, and federal public health officials. Unless the number of patients seeking treatment increases beyond the capabilities of the current staffing and bed availability the hospital may want to delay implementing the hospital disaster preparedness plan until confirmation of a BT incident is given. However, the Hospital Emergency Incident Command System (HEICS) should be activated at this time.

If the case is thought to be highly contagious it is important that all staff and visitors who may have been exposed be informed of the following:

- A potential exposure
- For their safety and the safety of others, they need to remain contained in a designated area
- Information will be collected from each person
- They will be given the opportunity to call/notify their family or friend of the situation
- They will be given proper medical care if necessary
- An Epidemiologist from the Health Department will meet with them

Staff members can continue to do job related responsibilities. Visitors will need close observation, assurance, and assistance.

The PIT should begin to record all events that take place including telephone threats, media requests, increased persons seeking medical care, etc. All media communication should be directed through the Sedgwick County Department of Emergency Management (SCDEM), and hospital staff should be counseled not to communicate with the media.

All emergency department admissions that present with similar clinical syndromes should be triaged as soon as possible. Report all new cases to the SCHD. If patients require hospitalization, the PIT should work with the nursing supervisors and admissions to ensure that patients are appropriately placed. The hospital disaster plan and BT plan should be reviewed prior to the confirmation of a BT incident by the SCHD. Frequent communication in the form of email updates and rounds on nursing units and other affected departments may help to assess the level of anxiety of the staff to prepare appropriate interventions. As the number of admissions rises, the staff may need emotional and physical support.

After confirmation of a BT incident by the SCHD, members of the Secondary Investigation Team (SIT) should be notified. The hospital disaster preparedness and BT response plans should be implemented to the degree appropriate with the current situation. All members of the PIT and SIT should convene to review current information and SCHD recommendations. All roles and responsibilities should be assigned to the appropriate personnel. As soon as the decision is made to implement the hospital disaster preparedness plan, the Team leader should notify 911 of the incident and request additional security for traffic and crowd control if necessary.

Local Health Department Investigation

After the SCHD determines that a BT incident is evolving, public health investigators may be dispatched to the hospital to collect information from affected patients. This investigation will take place as soon as possible from the time of confirmation to determine the source of the exposure and to identify and implement the most effective and efficient interventions.

External Communication

The hospital is responsible for notifying 911, the Sedgwick County Health Department, the Kansas Department of Health and Environment (KDHE). Direct communications will begin with the SCHD epidemiology and public health emergency management team to begin an investigation and determine recommendations for action.

911 will notify, local law enforcement and the FBI, the Sedgwick County Department of Emergency Management (SCDEM), and local officials. The SCHD will notify other area hospitals and clinics and KDHE. KDHE will notify the Center for Disease Control and Prevention who will notify USAMRIID and other federal agencies. SCDEM will notify the Kansas Department of Emergency Management (KDEM), public safety, and city/county officials. KDEM will notify the appropriate State and Federal agencies and officials.

Communication with the media and public

Until KDHE and the SCHD confirm that a BT incident is evolving, all media requests should be directed to the SCDEM Emergency Operations Center (EOC). Once the incident has been confirmed, the hospital and SCHD should work together to prepare information for the media and identify the person the media should contact.

A key role of the media in the case of a BT incident will be education of the public. The media should be provided with credible information about the incident as possible as dissemination of inaccurate information could delay the provision of care.

If possible, a telephone hotline should be established to provide information to the public. This will be accomplished by the SCDEM. Information about the hospital and how delivery of services that may be changing (canceling elective surgeries) will affect routine patient care should be provided. If the hospital has a website, information related to the incident should be posted and updated frequently throughout the day.

Guidelines for Operations:

It is recommended that all hospitals and clinics have guidelines and policies for responding to a terrorist-related patient case. Consider the following points:

- Once notification has begun the medical case becomes a law enforcement/criminal investigation case.
- Persons should be directed away from the areas where the infected patient may have been.
- Do not alter or dispose of any items that could be evidence or part of an investigation.
- If the patient is contagious it is essential that the exposed area and persons be confined or isolated.
- It may be determined that the facility be closed for a period of time.
- Public announcements will be made to divert the public away from the facility.

Refer to:

Sg Co Handbook BT Agents.xls

Refer to:

BT Agent Tx and Px Table.xls

Refer to:
Infection Control.xls

Refer to:
Infection Control.xls

ANTHRAX – Quick Reference

ALL SUSPECTED CASES OF ANTHRAX MUST BE TREATED AS A PUBLIC
HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE
SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- **Not transmitted person to person**
- Caused by the bacteria *Bacillus anthracis*
- Inhalation of aerosolized spores will be the most likely route of entry during a bioterrorism event.
- Spores are highly stable and highly resistant to chemical and physical agents

Clinical Signs and Symptoms:

- Incubation period is 1 – 6 days but may be longer to due the stability of spores.
- **Initial phase:** flu-like symptoms, low grade fever, malaise, fatigue, cough, mild chest discomfort.
- **Acute phase:** severe respiratory distress, shock, high fever and death in 24 – 36 hours.
- Chest x-ray will show **mediastinal widening** in a previously healthy patient.

Diagnosis:

- **All lab specimens should be handled in a Biosafety Level 2 Laboratory.**
- Gram stain: Gram-positive bacilli, occurring singularly or in short chains often with squared off ends (safety pins).

Patient Isolation:

- Standard barrier and contact precautions. Patients do not require isolation rooms.

Treatment:

- Ciprofloxacin, Doxycycline, or Penicillin or Amoxicillin if susceptible.
- Vaccinate if possible.

Prophylaxis:

- All exposed persons should be administered 3 doses of vaccine (days 0, 14, 28) if available.
- Ciprofloxacin or Doxycycline

BOTULISM – Quick Reference

**ALL SUSPECTED CASES OF BOTULISM MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- **Not transmitted person to person**
- Exposure could occur through contaminated food or water or by aerosol

Clinical Signs and Symptoms:

- Incubation period is 12-36 hours
- Blurred or double vision, dry mouth, sore throat, slurred speech, ptosis, dysphagia, acute bilateral cranial nerve impairment, afebrile
- May progress to a symmetrical flaccid paralysis resulting in respiratory failure

Diagnosis:

- Based on clinical symptoms
- Mouse neutralization bioassay

Patient Isolation:

- Standard barrier precautions recommended

Treatment:

- Botulism antitoxin, if available through the local health department
- Supportive care with respiratory support

Prophylaxis:

- None currently available

BRUCELLOSIS – Quick Reference

**ALL SUSPECTED CASES OF BRUCELLOSIS MUST BE TREATED AS A
PUBLIC HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE
SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- **Not transmitted person to person**
- Infection from as few as 10-100 organisms

Clinical Signs and Symptoms:

- Incubation period is 5-60 days
- Non-specific flu-like symptoms: fever, headache, myalgias, sweats, chills, weakness, malaise
- Cough, chest pain, and GI symptoms may also occur

Diagnosis:

- Long term cultures (>30 days) from blood or bone marrow
- Serum agglutination test

Patient Isolation:

- Standard precautions

Treatment:

- Doxycycline plus Rifampin, Doxycycline plus Gentamicin
- Other treatments also available as alternatives

Prophylaxis:

- Six weeks of oral treatments following exposure

CHOLERA – Quick Reference

ALL SUSPECTED CASES OF CHOLERA MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- **Not transmitted person to person**
- Acquired through ingestion of contaminated food or water

Clinical Signs and Symptoms:

- Incubation period is 1-5 days
- Sudden and severe onset
- Vomiting, abdominal distention and pain, profuse diarrhea
- Fluid loss can exceed 10 L per day

Diagnosis:

- Typically made by clinical signs and observations
- May isolate Gram negative bacilli from stool

Patient Isolation:

- Standard precautions are recommended

Treatment:

- Fluid and electrolyte replacement by oral or IV administration
- Antibiotics may shorten length of disease

Prophylaxis:

- Consider using vaccine if available

PLAGUE – Quick Reference

ALL SUSPECTED CASES OF PLAGUE MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- Caused by the bacterium *Yersinia pestis*
- Highly infectious in aerosol form
- Transmissible person to person via respiratory droplet

Clinical Signs and Symptoms:

- Incubation period of 1-3 days
- Pneumonic plague: high fever, chills, headache, productive cough – watery then bloody
- Death in almost 100% of untreated cases

Diagnosis:

- **All lab specimens should be handled in a Biosafety Level 2 Laboratory.**
- Gram negative coccobacilli with bipolar “safety-pin” appearance
- Immunofluorescent staining for capsule (F1 antigen) is diagnostic

Patient Isolation:

- Strict respiratory isolation with droplet protection until patient has received 48 hours of antibiotic treatment

Treatment:

- Streptomycin or Gentamycin are the choice antibiotics
- Doxycycline is an alternative choice
- Chloramphenicol should be added for cases with plague meningitis

Prophylaxis:

- Antibiotic prophylaxis is recommended for persons with aerosol exposure or close contact with a confirmed case
- Doxycycline is recommended and should continue for 7 days following last contact

Q FEVER – Quick Reference

**ALL SUSPECTED CASES OF Q FEVER MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- **Rarely transmitted person to person**
- Infectious dose as low as one organism

Clinical Signs and Symptoms:

- Incubation period is 2-14 days
- Fever, chills, headache, weakness, chest pain
- Few develop pneumonia, acute hepatitis, splenomegaly

Diagnosis:

- **Cultivation of organism extremely hazardous**
- Blood tests should be used to confirm diagnosis

Patient Isolation:

- Standard precautions

Treatment:

- Tetracycline, Doxycycline, or a quinolone (Ciprofloxacin)

Prophylaxis:

- Tetracycline, Doxycycline, or a quinolone (Ciprofloxacin) started within 8 – 12 days following exposure

SMALLPOX – Quick Reference

**ALL SUSPECTED CASES OF SMALLPOX MUST BE TREATED AS A PUBLIC
HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE
SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- Caused by the Variola virus
- Highly infectious and transmissible
- Virus can be spread by contaminated linens and clothing

Clinical Signs and Symptoms:

- Incubation period of 12-14 days
- Initial flu-like symptoms
- Skin lesions appear after 2-4 days progressing to pustules starting in the center of the body and spreading out
- Pustules scab over in 1-2 weeks

Diagnosis:

- **All lab specimens must be handled in a Biosafety Level 4 Laboratory.**
- Evaluated by electron microscopy and cell culture

Patient Isolation:

- **Strict isolation in negative pressure room (HEPA ideal)**
- **All individuals in the hospital (HCWs, visitors, patients) from time case arrives until placed in a negative pressure isolation room should be vaccinated.**
- Mask and gloves should be worn by person obtaining specimen; preferably the person should also be vaccinated
- Laundry and waste should be autoclaved prior to laundering or disposal

Treatment:

- Supportive care is the mainstay of treatment

Prophylaxis:

- Vaccine is required for all persons exposed and those with a close personal contact with a smallpox case within 3 days of exposure
- All exposed persons should be placed in strict quarantine for 17 days following last contact with smallpox case

TULAREMIA – Quick Reference

ALL SUSPECTED CASES OF TULAREMIA MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY AND REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- Caused by the bacterium *Francisella tularensis*
- Highly infectious in aerosol form
- Person to person transmission does not occur
- Infectious dose can be as low as 10-15 organisms

Clinical Signs and Symptoms:

- Incubation period of 3-5 days but can vary
- **Pneumonic:** fever, chills, headache, malaise, unproductive cough, abdominal pain, myalgias
- **Systemic:** fever, chills, sore throat, myalgias, nausea, vomiting, abdominal pain, loose or watery diarrhea

Diagnosis:

- High index of suspicion based on clinical presentation
- **All lab specimens should be handled in a Biosafety Level 3 Laboratory. Laboratory workers at high risk of infection.**
- Organism difficult to culture and grows poorly on standard media
- Cysteine-enriched media is required
- Serology most common diagnosing tool

Patient Isolation:

- Isolation not required
- Standard barrier precautions recommended

Treatment:

- Streptomycin, Gentamycin, Ciprofloxacin or Doxycycline

Prophylaxis:

- Doxycycline or Ciprofloxacin
- Most effective if started within 24 hours of exposure

VIRAL HEMORRHAGIC FEVER – Quick Reference

**ALL SUSPECTED CASES OF VHF MUST BE TREATED AS A PUBLIC HEALTH
EMERGENCY AND REPORTED IMMEDIATELY TO THE SEDGWICK
COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- Caused by several distinct families of viruses
- Highly contagious, increasing as the patients condition deteriorates
- Tissue, blood, and body fluids can contain the virus
- Can be aerosolized by a coughing patient

Clinical Signs and Symptoms:

- Incubation period varies from 5-42 days
- Common symptoms: fever, myalgias, prostration, conjunctival injection, hypotension, flushing, petechial hemorrhages, shock, generalized hemorrhaging
- Symptoms will vary slightly depending on agent

Diagnosis:

- Presumptive based on clinical signs and symptoms
- **All laboratory samples must be handled in a Biosafety Level 4 Laboratory**

Patient Isolation:

- Strict respiratory isolation with droplet protection (respirator, face shield, gowns, gloves) should be followed
- Patient should be placed in a negative pressure room if possible
- All waste and linens should be autoclaved

Treatment:

- Supportive care with pain and fever control, sedation and hydration

Prophylaxis:

- None available

ANTHRAX – Fact Sheet

ALL SUSPECT CASES OF ANTHRAX SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- **Not transmitted person – to – person**
- Can be inhaled, ingested, or inoculated. During a bioterrorist event, inhalation will be the most likely route of entry.
- Spores are highly stable and highly resistant to chemical and physical agents

Clinical Signs and Symptoms:

- Incubation period is 1 – 6 days but may be longer due to the stability of spores.
- Fever, malaise, fatigue, cough, mild chest discomfort progressing to severe respiratory distress and death in 24 – 36 hours.
- Chest x-ray will show mediastinal widening in a previously healthy patient.
- Mortality rate approaches 90% for inhalation anthrax, even with treatment.

Laboratory Diagnosis:

- **All lab specimens should be handled in a Biosafety Level 2 Laboratory.**
- Gram stain: Gram-positive bacilli, occurring singularly or in short chains often with squared off ends (safety pins).
- Biochemical characteristics: non-hemolytic, non-motile, capsulated bacteria susceptible to gamma phage lysis.
- ELISA and PCR tests are available at national reference laboratories.

Patient Isolation:

- Standard barrier precautions are recommended. Patients do not require isolation rooms.

Treatment:

- If not contraindicated, all patients should be administered Ciprofloxacin or Doxycycline until susceptibility to Penicillin is confirmed.
- If not contraindicated, all patients should be treated with the anthrax vaccine, if available. All patients should be continued on antibiotic treatment until all 3 doses of vaccine have been administered (days 0, 14, 28).
- If vaccine is not available, antibiotic treatment should be continued for 60 days.

Prophylaxis:

- All exposed persons (as determined by local or state health departments) should be administered 3 doses of vaccine (days 0, 14, 28) if available.
- Antibiotic prophylaxis should start immediately with Ciprofloxacin or Doxycycline. Penicillin or Amoxicillin can be started once susceptibility is confirmed.
- Antibiotic treatment should be continued until all 3 doses of vaccine are administered. If vaccine is unavailable, antibiotic treatment should be continued for 60 days.

ANTHRAX – OVERVIEW

EPIDEMIOLOGY

Anthrax is caused by *Bacillus anthracis*, a Gram-positive spore forming bacteria that is generally a zoonotic disease, but can be transmitted to humans. Three clinically separate forms of the disease can be seen in humans: cutaneous, inhalation, and gastrointestinal. The most common form is cutaneous and is seen in persons who work with infected animals or their contaminated products (hides, wool, hair, bone, etc). Ingesting contaminated meat causes gastrointestinal anthrax. Inhalation anthrax is caused by the inhalation of spores and occurs most often in persons working with contaminated animal hides. There has not been a case of naturally occurring inhalation anthrax in the United States since 1978.

The spores of anthrax are highly resistant to both physical and chemical disinfecting agents. The spores can last several years in soil and in places where contaminated animals were housed and processed.

Countries in Europe, Asia, and Africa have endemic human anthrax due to anthrax being in their animals. Naturally occurring anthrax is very uncommon in the United States, with only five human cases, all cutaneous, occurring between 1981 and 1996.

As a bioterrorism weapon, it will most likely be caused by the release of aerosolized spores leading to the inhalation form of the disease. It may also be spread through packages or the mail. The bacteria is easy to culture and the spores easy to produce from the bacteria. There is a vaccine for anthrax, however it is currently limited to the United States military and not available for the general public.

Anthrax has not been shown to be transmitted person to person.

CLINICAL MANIFESTATION

Three forms of the disease are possible: inhalation, cutaneous, and gastrointestinal.

Inhalation anthrax will be the most likely form to be seen in the event of a bioterrorist attack.

The incubation period for the disease is typically from 1 – 6 days, but may be as long as 60 days after exposure to the spores.

The initial phase of the disease will present with a non-specific flu-like symptoms. These symptoms may include fever, malaise, fatigue, cough, headache, mild chest or abdominal discomfort, and vomiting. These symptoms may subside for a short period (hours to days). The second phase of the disease will show severe respiratory distress, dyspnea, stridor, cyanosis, and septicemia. These patients may also have subcutaneous edema in the neck and chest, and elevated temperature, pulse, and respiratory rates. Shock and death may follow within 24 – 36 hours after the onset of the second phase symptoms of the disease.

After the onset of the second phase symptoms, mortality for anthrax will exceed 90%. Hemorrhagic meningitis will develop in approximately 50% of cases.

Cutaneous anthrax has an incubation period of 1-7 days and will typically present with a skin lesion in the infected area (commonly the forearms, hands, and head). The lesion will start as a small, pruritic, painless papule that resembles an insect bite. This papule will fill with fluid within a couple of days, then rupture, forming a painless depressed ulcer. A 1-3 cm eschar, typically black and necrotic, will develop in the center of the ulcer. The eschar will separate from the skin in approximately 1-2 weeks and will leave a permanent scar. There may also be some systemic symptoms associated with the disease including fever, headache, myalgias, and lymphangitis.

Mortality from the cutaneous form of the disease will approach 20% in untreated cases, but <1% in cases that are effectively treated with antibiotics.

Ingesting contaminated, improperly cooked meat most often causes gastrointestinal anthrax. It has an incubation period of 2-7 days and will present with one of two forms: intestinal and oropharyngeal.

Intestinal symptoms may include nausea, vomiting of blood, fever, abdominal pain, and possibly severe, bloody diarrhea. There may be lesions present in the colon.

Oropharyngeal symptoms may include fever, sore throat, dysphagia, and lymphadenopathy. There may be lesions in the oral cavity, with edema and tissue necrosis in the cervical area.

Mortality for patients with GI anthrax ranges from 25-60% if untreated.

DIAGNOSIS

All laboratory work should be performed in a Biosafety Level 2 facility.

Microbiology

The bacteria *Bacillus anthracis* can be cultured and isolated from the patient's blood, pleural fluid, CSF, ascitic fluid, vesicular fluid or lesion exudate. Blood cultures should be positive for growth within 12-48 hours on blood or nutrient agar. Blood agar cultures will be non-hemolytic and have rough, gray-white tenacious colonies with comma-shaped protrusions. Subcultures on blood agar should be tested for gamma phage lysis and penicillin resistance. The bacteria will be non-motile. A bacterial capsule will appear when the organism is grown nutrient agar with 0.7% bicarbonate incubated overnight in a candle jar. Examine for capsule with methylene blue or India ink.

A Gram stain of the appropriate fluid or resulting culture will show positive bacilli. The bacteria will occur in short chains or singly and have bipolar squared ends ("safety-pin" appearance).

An ELISA test for the protective antigen and PCR test for detection of nucleic acid can be performed and will provide a preliminary diagnosis of anthrax within several hours. These tests are currently available only at reference laboratories.

Radiology

The inhalation form of anthrax will typically show a mediastinal widening upon x-ray. Approximately 55% of cases also will show pleural effusion late in the disease.

Autopsy

Observations may include: hemorrhagic necrotizing mediastinitis, thoracic hemorrhagic necrotizing lymphadenitis, and hemorrhagic meningitis.

ISOLATION / DECONTAMINATION

Patient isolation is not required for any form of anthrax. Standard precautions are recommended for all patients. Contact precautions are recommended for cases with uncontrolled diarrhea or vomiting.

Clothing, linens, or other contaminated items should be discarded, bagged, labeled, and sent for decontamination and processing. Medical wastes should be disposed of following standard procedures.

Autopsy/Handling of Corpses: All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

See treatment/prophylaxis tables.

All cases should initially be treated with either Ciprofloxacin or Doxycycline until sensitivity to penicillin can be determined. Once the organism is shown to be sensitive to penicillin, the patient can be placed on either penicillin or amoxicillin.

Prophylaxis should include Ciprofloxacin or Doxycycline, and may include the vaccine if recommended.

VACCINE- (UPDATED- JANUARY 2003)

A- Notice to Readers: Use of Anthrax Vaccine in Response to Terrorism: Supplemental Recommendations of the Advisory Committee on Immunization Practices (ACIP).

Overview: In December 2000, the ACIP released its recommendations for using anthrax vaccine in the U.S. Because of recent terrorist attacks involving the intentional exposure of U.S. civilians to *Bacillus anthracis* spores and concerns that the current anthrax vaccine supply is limited, ACIP developed supplemental recommendations on using anthrax vaccine in response to terrorism. These recommendations supplement the previous ACIP statement in three areas: use of anthrax vaccine for pre-exposure vaccination in the U.S. civilian population, the prevention of anthrax by post exposure prophylaxis (PEP), and recommendations for additional research related to using antimicrobial agents and anthrax vaccine for preventing anthrax.

Inhalation Anthrax Treatment and Prophylaxis Protocol

	Treatment	Prophylaxis
Adults	Ciprofloxacin 400 mg IV q 12 h x 7 d ¹ Or 500 mg PO bid x 60 d OR	Administer vaccine if available Ciprofloxacin 500 mg PO bid x 60 d OR
	Doxycycline 100 mg IV q 12 h x 7 d ¹ Or 100 mg PO bid x 60 d OR	Doxycycline 100 mg PO bid x 60 d OR
	Penicillin ² G 4 MU q 4 h x 7 d ¹ Amoxicillin ² 500 mg q 8 h x 60 d	Amoxicillin ² 500 mg PO q 8 h x 60 d
Pediatric	Ciprofloxacin 15 mg/kg IV q 12 h x 7 d ^{1,3} Or 15-20 mg/kg PO q 12 h x 60 d ³ OR	Ciprofloxacin 15-20 mg/kg PO q 12 h x 60 d OR
	Doxycycline ⁴ : >8 yrs and >45 kg: 100 mg IV bid x 7 d ¹ or: 100 mg PO bid x 60 d >8 yrs and <45 kg: 2.2 mg/kg/d in 2 divided doses x 7 d ¹ or: 2.2 mg/kg PO bid x 60 d <8 yrs: same as (>8 yrs and <45 kg IV and PO) OR	Doxycycline ⁴ : >8 yrs and >45 kg: 100 mg PO bid x 60 d >8 yrs and <45 kg: 2.2 mg/kg PO bid x 60 d <8 yrs: same as (>8 yrs and <45 kg) OR
	Penicillin G ² : 400,000 U/kg/d in divided doses x 7 d ¹	Amoxicillin ² : <20 kg: 13 mg/kg PO q 6 h x 60 d >20 kg: 500 mg PO q 8 h x 60 d
Pregnancy	Same as for non-pregnant adults (high mortality rate outweighs risk posed by antibiotic). Oral Doxycycline is not recommended for more than 14 days.	
Immuno-compromised	Same as for non-immunocompromised children and adults.	

Inhalation Anthrax Treatment and Prophylaxis Protocol

1. Intravenous treatments should be switched to oral treatment when clinically appropriate, even if prior to 7 days, and continued on a 60-day course of treatment.
2. Penicillin G and Amoxicillin should only be used when organism shows sensitivity to the antibiotic.
3. Children should not receive more than 1 gram of Ciprofloxacin per day.
4. Doxycycline is included in a recommendation amendment by the American Academy of Pediatrics to allow the use of tetracyclines in young children for the treatment of serious infections.

Anthrax – Frequently Asked Questions (FAQ)

What is anthrax?

Anthrax is a bacterium (germ) that may intentionally be sent through the mail or in a package or released into the air (bioterrorism) and breathed (inhaled) into people's lungs causing severe respiratory distress. The germ can also get into open sores on the skin. Rarely the germ can be eaten and cause stomachache, vomiting and diarrhea.

Can I get anthrax from an infected person?

The infection is NOT spread from person to person.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start from 1 – 6 days after exposure to the germ. Since the germ can live for a long time in the environment, symptoms may not start for up to 60 or more days after the germ was released into the air.

What are the symptoms of infection?

If the germ invades your lungs, you will have a fever, possibly a non-productive cough, and severe shortness of breath. If the skin is infected, an itchy, black spot with swelling may appear. If the germ is eaten, you may develop a stomachache, vomiting, and diarrhea that may be bloody.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

You may have to take the antibiotic for a long time, up to 60 days. The local health officer will make frequent announcements to give you the most current information. You should continue taking the antibiotic for as long as your doctor or nurse has prescribed it for.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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ANTHRAX – HOME CARE INSTRUCTIONS

If there is a widespread release of anthrax, many people could be affected and require hospitalization. It is possible that hospitals may become overcrowded and sick persons may need to be cared for in their home by family members or community home health assistance. It would be important if possible to get the sick person assessed by a health professional and to get the necessary medications as soon as possible. The following are basic instructions for giving care to sick persons:

Cleanliness:

- Wash your hands with soap and water before you eat or drink, after using the bathroom and after contact with the sick person.
- Wear gloves (vinyl or latex) when you have contact with the sick person's blood and other body fluids (urine, feces, vomit, wound drainage, mucous or saliva).
- Wash your hands after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood and other body fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids.
- Wash soiled clothes and bed linens in warm water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.

Care:

- If an antibiotic is recommended, give it exactly as prescribed by the doctor or nurse. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least twice a day. If the temperature goes above 100° F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®.
- Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse)
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Assist or reposition the sick person in bed every couple of hours, and gently massage their arms, legs and back.
- Keep a simple daily intake and output record, 1.) how much food and liquids are taken. 2.) how much urine and if there is a bowel movement

Self-Care:

- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently, and eat a healthy diet. Even if you are not taking an antibiotic, take your temperature in the morning and afternoon for 3 weeks. If you develop a fever above 100° F or if have shortness of breath, seek medical attention immediately.

MMRS – Sedgwick County Kansas

ANTHRAX - PLAN FOR ZERO PREVALENCE AREA

By: Dr. Mark Mosley – Wesley Medical Center

December 2001

Instructions: * To be used in conjunction with Anthrax Response and Treatment Protocols Matrix and other approved protocols

I. STAGE ONE:

Education – Public relations campaign beginning prior to Influenza season and ongoing throughout “flu” season.

A. General Public

- “no anthrax cases here”
- “no testing at this time”
(TV, newspaper, radio, etc...)

B. Physicians and Medical Community

- “Don’t test, don’t treat, don’t send to ER”
(Mailing of “Anthrax Plan” or decision tree)

II. STAGE TWO:

Person who is asymptomatic who wants testing or information

Give out hotline phone number to:

A. CDC

B. Local Health Department

III. STAGE THREE:

Suspect anthrax presence (“white powder”) or asymptomatic exposure

A. Suspect anthrax presence (“white powder”) – CALL 911

B. Suspect asymptomatic exposure (e.g. presents to ER)

1. Place in private area to prevent panic
2. “No test, No treat” in asymptomatic zero prevalence
(unless potential risk is considerable – postal worker or visitor from D.C. with white powder exposure recently)
3. Offer ComCare (Vivian Bat) as possible follow-up

*all hospitals and clinics to use same decision tool

IV. STAGE FOUR:

Symptomatic (“itchy skin” or “flu patients”) in zero prevalence low risk

- A. Consider testing and/or treating for influenza, if appropriate
- B. No testing, no treating for Anthrax (same as III.-B)
- C. Offer ComCare as possible follow-up and hotline numbers
*all hospitals and clinics to use same decision tool with handouts to patients with hotline numbers

PREVELANCE REPORTS

V. STAGE FIVE:

Approach once reported anthrax case in Kansas or very nearby (northern Oklahoma, Western Missouri, etc...)

- A. Suspect anthrax presence (“white powder”): 911
 - HAZ-MAT will triage and field test (same)
- B. Asymptomatic with no exposure (“just wants testing”)
 - CDC and Health Department hotlines
 - Consider independent “Anthrax clinic” for information, reassurance, diversion away for ER, Health Department and Medical offices if panic widespread
- C. Asymptomatic with presumed possible exposure
 - ER to decontamination area
 - **Initiate MMRS Notification Plan**
 - Discern risk and treat/test accordingly
(a new decision tree sheet would need to be developed giving criteria for high, moderate and low risk)
- D. Symptomatic (“flu” systems) with or without exposure
 - ER to decontamination area
 - **Initiate MMRS Notification Plan**
 - Discern risk with likely treatment (Doxycycline) depending on history and risk

References

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BOTULISM – Fact Sheet

**ALL SUSPECT CASES OF BOTULISM SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- **Not transmitted person – to – person**
- Caused by toxins of the bacterium *Clostridium botulinum*
- Generally a food borne disease from improperly prepared foods; toxins can be made into an aerosol form in a bioterrorism event
- Toxin is one of the most potent toxins in nature (100,000 times more potent than sarin)

Clinical Signs and Symptoms:

- Incubation period is typically 12-36 hours (range 6 hours – 10 days)
- Cranial nerve palsies, blurred or double vision, dysphagia, flaccid symmetrical descending paralysis leading to respiratory failure and death
- Patient typically will be afebrile, alert, and oriented
- May progress to symmetrical flaccid paralysis
- Sensory symptoms generally do not occur

Diagnosis:

- Based on clinical symptoms
- Several patients presenting afebrile with flaccid paralysis may indicate botulism intoxication
- Serum samples may be sent to a lab to perform a mouse neutralization bioassay

Patient Isolation:

- Standard barrier precautions are recommended

Treatment:

- Supportive care with respiratory support; support may be necessary for up to one year following exposure in extreme cases
- If available, botulism antitoxin should be administered as soon as possible following exposure
- Antitoxin can only neutralize circulating toxin

Prophylaxis:

- None currently available for use

BOTULISM – OVERVIEW

EPIDEMIOLOGY

The neuromuscular disease botulism is caused by toxin produced by the bacteria *Clostridium botulinum*. Occasionally two additional bacteria, *Cl. barati* and *Cl. butyricum*, may also produce the botulism toxin. There are 7 distinct antigenic types of botulism toxin, designated by the letters A – G. The most commonly occurring type in the United States is type A. Classically, botulism is caused by the ingestion of the toxin through contaminated foods, particularly vegetables. It can also be caused by infection with the bacteria itself (wound botulism) or by the colonization of the bacteria in the intestine, with the release of the toxin by the live bacteria (infant botulism).

Botulism toxin is one of the most potent compounds known to man, 100,000 times more potent than sarin. Iraq has admitted to producing over 19000 L of botulism toxin and loading as much as 10000 L into military weapons during the Gulf War. The Japanese cult Aum Shinrikyo released botulism toxin during a failed terrorist attack in Japan.

Botulism toxin acts by binding irreversibly to the presynaptic receptors of peripheral nerves. This causes the inhibition of acetylcholine release, resulting in skeletal muscle and bulbar paralysis. Recovery from infection can take weeks to months, and can require the use of ventilators in severe cases.

Injection drug use resulting in wound botulism is now the most commonly recognized form of botulism in the United States. Botulism may also present with single cases or small clusters of cases related to home canned goods, particularly low acid or low alkaline foods (carrots, beans, peppers, corn), although tomatoes have also recently been implicated as well. Sauteed onions, baked potatoes wrapped in foil, garlic in oil, and commercial cheese sauces have also recently been shown to cause outbreaks. Inactivation of the toxin is caused by heating (>85 °C for 5 minutes), so botulism is always caused by improperly heated foods.

Botulism is not transmitted person to person.

A bioterrorist incident would most likely be caused by the intentional release of an aerosol containing botulism toxin, although it is possible for deliberate contamination of food or water sources to be the cause. Suspicion should be raised if an outbreak of botulism had some of the following characteristics:

- An unusual toxin type
- An outbreak with no common food source, no wounds, and no history of injection drug use, but possibly having a common place (airport, bus station, etc) and time
- A clinical presentation of botulism with no gastrointestinal syndromes.

CLINICAL MANIFESTATION

If a bioterrorist attack were to occur using botulism toxin, release of an aerosol would be the most probable route, but it is possible to be caused by the contamination of food or water sources. Inhalation botulism would have an identical presentation to ingestion botulism with the exception being an absence of GI syndromes.

The incubation period is typically 12 – 36 hours, but can be several days depending on the dose.

Patients may present with any or all of the following symptoms, and they may appear in any order:

Early: blurred or double vision, difficulty swallowing or speaking, dry mouth, dizziness, general weakness.

Late: ptosis, symmetrical descending flaccid paralysis, respiratory failure.

Most patients are alert and responsive and most do not have sensory deficits. Fever does not generally occur unless there is also an infection.

DIAGNOSIS

Diagnosis is typically made on a high level of clinical suspicion, and may be based on epidemiological evidence. A recognized source of exposure may not be present during a bioterrorist attack.

The detection of the botulism toxin in the patient's serum or stool will be confirmatory for diagnosis. Detection will be dependent upon total dose absorbed and time, and will be evaluated by mouse neutralization bioassay, which can detect as little as 0.03 nag of toxin.

ISOLATION / DECONTAMINATION

Patient isolation is not required for botulism. Standard precautions are recommended for all patients. Soiled diapers from infants with ingestion botulism should be handled with gloved hands, and hands should be washed immediately after handling.

Medical wastes should be disposed of following standard procedures.

Autopsy/Handling of Corpses: All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

Rapid administration of botulism antitoxin and supportive care are key to successful patient management. Patient should be watched closely in case respiratory care is required.

Skin testing for sensitivity before administration of the antitoxin is required to reduce the incidence of serum sickness. The antitoxin will only bind with free-floating toxin, so

toxin that is already absorbed in the system will not be affected by the antitoxin. With the use of the antitoxin, mortality rates for botulism have fallen to approximately 6% in the past few years (from 25% in the 1950s).

Botulism – Frequently Asked Questions (FAQ)

What is botulism?

Botulism is a disease caused by the poison released from the bacterium *Clostridium botulinum*. There are three types of the disease: food borne botulism, wound botulism, and infant botulism. All three types are considered serious medical conditions and should be treated by a physician as soon as possible. In the event of a bioterrorist attack involving botulism, the toxin will most likely be released as an aerosol or used to contaminate foods.

Can I get botulism from an infected person?

You cannot get botulism from an infected person.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start as soon as 12-36 hours or as long as a couple of days after exposure to the toxin. The time will depend on the dose that is received.

What are the symptoms of infection?

If you are exposed to the toxin by breathing or eating contaminated foods, you may develop the following symptoms: blurred or double vision, dry mouth, difficulty swallowing or breathing, and possibly muscle paralysis.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) may treat you with an antitoxin. You will also be closely monitored to make sure your symptoms do not get worse, and to properly take care of you if your symptoms do get worse.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you will be offered an antitoxin. You will also be closely monitored to ensure that you do not develop symptoms of the infection.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have any of the symptoms listed above and believe that you were exposed to the botulism toxin.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antitoxin and where you can obtain the antitoxin. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS BOTULISM

In the event of an intentional release of the organism that causes **Botulism**, many people may require hospitalization within a few days of exposure. Do not attempt to care for anyone at home who shows symptoms of botulism. If you or any member of your family has or develops any of the following symptoms, go to the nearest hospital emergency room immediately:

- Blurred or double vision
- Trouble swallowing food or liquids
- Dry mouth
- Trouble speaking
- Trouble breathing

If you do not have any symptoms, you should practice good personal hygiene as follows:

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with any sick individual.
- Wash soiled clothing and bed linens in warm water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet.

Please listen to local radio or television stations for continual updates on this public health emergency.
Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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BRUCELLOSIS – Fact Sheet

**ALL SUSPECT CASES OF BRUCELLOSIS SHOULD BE CONSIDERED A
PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY
TO THE SEDGWICK COUNTY HEALTH DEPARTEMENT
24 Hour Pager 579-1920**

Epidemiology:

- Caused by one of four pathogenic species of the coccobacilli *Brucella*
- Also known as “undulant fever”
- Most often associated with the ingestion of unpasteurized dairy products
- A bioterrorism event could be caused by aerosolization or contamination of food
- Infection could result from exposure to as few as 10-100 organisms

Clinical Signs and Symptoms:

- Incubation period is 5 – 60 days
- Non-specific flu-like symptoms with either acute or insidious onset
- Fever, headache, myalgias, back pain, sweats, chills, weakness, malaise
- Depression and change in mental status are noteworthy
- Cough and chest pain as well as GI symptoms may also occur

Diagnosis:

- Bone marrow or blood cultures may yield the organism if the culture is maintained for more than 30 days
- A serum agglutination test may detect antibodies

Patient Isolation:

- Standard precautions are recommended
- Isolation is not required

Treatment:

- Doxycycline plus Rifampin for 6 weeks is recommended
- Doxycycline plus Gentamycin is an alternative
- TMP/SMX plus Gentamicin or ofloxacin plus Rifampin are also alternatives

Prophylaxis:

- A three to six week course of one of the above mentioned treatments is prescribed as prophylaxis following exposure

BRUCELLOSIS – Overview

EPIDEMIOLOGY

Brucellosis is caused by members of the *Brucella* species, including *B. abortus*, *B. melitensis*, *B. suis*, and *B. canis*.

Humans are an accidental host of the disease and contract it by having direct contact with infected animals or their contaminated hides. Another common mode of transmission is through the ingestion of unpasteurized milk or milk products. It has also been shown to be transmitted through inhalation of aerosol generated on farms and in slaughterhouses. Brucellosis is primarily an occupational disease of farmers, ranchers, veterinarians, meat inspectors, and laboratory personnel. Incidence in the United States is currently less than 100 cases per year.

A bioterrorist incident would most likely result from the release of an aerosol, although contamination of foods could occur.

CLINICAL MANIFESTATION

The incubation of the disease ranges from 5-60 days, although most cases will show symptoms within 3-4 weeks after exposure.

Symptoms of the disease are generally non-specific. They include: irregular fever, headache, weakness, fatigue, chills and sweating, generalized myalgias, and joint pain. Depression and mental status changes are noteworthy. Serious complications of the disease can include osteomyelitis, meningitis, and endocarditis. The disease can reappear as a relapse.

Mortality rates are less than 2% in untreated cases and usually results from endocarditis.

DIAGNOSIS

Diagnosis is isolation of *Brucella* species from the blood or bone marrow of an infected patient. Cultures require long incubation times, up to 6 weeks, to exhibit growth. Bone marrow cultures will generally yield the diagnosis in a higher percentage of cases.

Serum agglutination tests are available to detect antibodies to most of the disease causing species. However, *B. canis* will not cross react with other species and has its own specific test.

ISOLATION / DECONTAMINATION

Patient isolation is not required. Standard precautions are recommended for all patients. Medical wastes should be disposed of following standard procedures.

Autopsy/Handling of Corpses: All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

Treatment is recommended and should be continued for up to 6 weeks to prevent a relapse. Combination therapy is also recommended.

See Treatment / Prophylaxis guidelines.

VACCINE

No vaccine is currently available.

Brucellosis Treatment and Prophylaxis Protocol

	Treatment	Prophylaxis
Adults¹	Doxycycline 200 mg/d PO x 6 wks plus Rifampin 600 mg/d PO x 6 wks ¹	None currently recommended
	Tetracycline 500 mg/d PO x 6 wks Streptomycin 1 gm/d x 6 wks Gentamicin 3-5 mg/kg/d in 3 doses	
Pediatric	Consider Trimethoprim/Sulfamethoxazole (TMX) for children <8 yrs Determine proper treatment using current references.	None currently recommended
Pregnancy	Determine proper treatment using current references.	
Immuno-compromised	Determine proper treatment using current references.	

1. Combination treatment is recommended (Doxy + Rifampin)

Brucellosis – Frequently Asked Questions (FAQ)

What is brucellosis?

Brucellosis is a bacterium (germ) that may intentionally released into the air (bioterrorism) and breathed (inhaled) into people's lungs causing illness resembling the flu and but may lead to other more serious complications. Rarely the germ can be ingested (eaten), most commonly through unpasteurized milk and dairy products.

Can I get brucellosis from an infected person?

The infection is NOT spread from person to person.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start from 5-60 days after exposure to the germ, although most people begin to show symptoms after 3-4 weeks. Since the germ can live for a long time in the environment, symptoms may not start for up to 60 or more days after the germ was released into the air.

What are the symptoms of infection?

Symptoms of the disease are generally non-specific and can resemble the flu. Some symptoms are an irregular fever, headache, weakness, fatigue, chills and sweating, and muscle and joint pain. You may also develop depression. Less than 2% of those who are exposed to the bacterium and are left untreated will die from the disease.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

The local health officer will make frequent announcements to give you the most current information. You should continue taking the antibiotic for as long as your doctor or nurse has prescribed it for.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS BRUCELLOSIS

In the event of an intentional release of the organism that causes Brucellosis, many people may require hospitalization within a few days of exposure. Hospitals may quickly become overwhelmed and unable to take care of every person who seeks treatment. For this reason, some sick people may have to be cared for in their home by relatives or friends. The following information may be helpful to those providing care to the sick.

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with the sick individual.
- Wear vinyl or latex gloves when you have the potential to contact the sick person's blood or other bodily fluid (urine, feces, vomit, wound drainage, mucous, saliva). Wash your hands with soap and water after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood or other bodily fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is prescribed to the sick person, give it exactly as prescribed by the doctor. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least two times a day. If the temperature rises about 100° F give Tylenol or other medicine such as Motrin or Advil. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, seek medical advice or take the person to the nearest designated emergency center or hospital.
- If the person develops breathing problems, go immediately to the nearest designated emergency center or hospital.
- Give the sick person plenty of fluids such as water and juice. Allow the person to eat solid food as it is tolerated.
- Change the sick person's clothing and bed linens often, especially if they become soiled with blood or bodily fluids.
- Wash soiled clothing and bed linens in warm water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet. Even if you are not taking an antibiotic, take your own temperature in the morning and afternoon for one month. If you develop a fever above 100° F or if you have flu-like symptoms, seek medical attention immediately.

Please listen to local radio or television stations for continual updates on this public health emergency.

Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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CHOLERA – Fact Sheet

**ALL SUSPECT CASES OF CHOLERA SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920**

Epidemiology:

- **Not transmitted person – to – person**
- Acquired through the ingestion of contaminated food or water
- Caused by the bacterium *Vibrio cholera*

Clinical Signs and Symptoms:

- Incubation period is 1-5 days
- Classic form has a sudden and severe onset
- Vomiting, abdominal distension and pain with little fever followed by profuse, watery diarrhea with a “rice-water” appearance
- Fluid loss may exceed 10 liters per day resulting in shock and death from dehydration
- Large mortality rate during an epidemic due to the requirements for supportive therapy

Diagnosis:

- Typically made by clinical signs
- Gram negative bacilli may be identified upon examination of stool samples

Patient Isolation:

- Cholera is typically not transmitted person to person
- Standard barrier precautions are recommended

Treatment:

- Fluid and electrolyte replacement is the mainstay of therapy
- Replacements may be accomplished through oral electrolyte solutions and rehydration salts in less severe cases; may require IV replacement in more severe cases.
- Antibiotics such as Tetracycline or Doxycycline may help to shorten the duration of the disease and therefore decrease fluid loss
- May be resistant to Tetracycline; Ciprofloxacin, Erythromycin, Furazolidone, or Co-trimoxazole may be considered for antibiotic therapy

Prophylaxis:

- Consider using vaccine

CHOLERA – OVERVIEW

EPIDEMIOLOGY

Cholera is a disease caused by the ingestion of contaminated food, particularly seafood, or water containing the bacterium *Vibrio cholera*. Humans are the only known natural reservoir for the disease. Free living *V. cholera* organisms can be found in aquatic environments. Boiling or chemical treatment of water and properly cooking foods will kill the organism. The organism can also be spread indirectly through the oral-fecal route.

Only two serogroups of the *V. cholera* have been known to cause epidemics: O1 and O139. The El Tor biotype of the O1 serogroup is the most common cause for epidemics and infections. Other serogroups may cause occasional disease but not epidemics.

Cases of traveler's cholera have greatly increased since the 1990s due to the return of the disease to Latin America.

CLINICAL MANIFESTATION

The incubation period for cholera is a few hours to five days, with symptoms typically starting in 1-5 days. Many infected individuals will show no symptoms of the disease.

Classical cholera is manifest by severe and sudden onset of painless vomiting with little or no abdominal pain and no fever. This will progress to voluminous diarrhea with a "rice-water" appearance. Fluid losses can exceed 10L per day. Dehydration and hypovolemic shock can result.

DIAGNOSIS

Diagnosis is typically based on clinical observations.

Vibrio cholera organisms can usually be cultured from stool samples. They are a small, Gram negative, motile bacillus. Suspect colonies can then be confirmed using a serum agglutination test with specific antisera.

ISOLATION / DECONTAMINATION

Patients do not need to be isolated. Standard precautions are recommended, and contact precautions are recommended for patients with severe vomiting or diarrhea.

TREATMENT / PROPHYLAXIS

The main course of therapy for cholera is the replacement of fluids and electrolytes, either orally or through the intravenous route.

Antibiotics may shorten the course of the disease, therefore decrease the loss of fluid. Tetracycline or Doxycycline are good choices for this, however, there may be some concerns over the resistance of the organisms to tetracycline.

Prophylaxis could include the use of an antibiotic and/or the use of the available vaccine.

VACCINE

A vaccine is available. It is at best only modestly effective providing approximately 50% protection from the disease for a period of not more than 6 months. Vaccination is not recommended in most cases.

Cholera Treatment and Prophylaxis Protocol

	Treatment	Prophylaxis
Adults ¹	Oral or IV rehydration therapy is the mainstay of treatment.	Consider using the oral vaccination.
	Ciprofloxacin 1 gram q day x 3 d	
	Doxycycline 300 mg x 1 d	
	Tetracycline 500 mg qid x 3 d	
Pediatric ¹	Tetracycline mg/kg in 4 doses per day x 3 d	Consider using the oral vaccination.
	Consider using Ciprofloxacin or Doxycycline	
Pregnancy	Determine appropriate treatment by reviewing current information.	
Immuno-compromised	Same as for non-immunocompromised children and adults.	

1. Rehydration therapy will be the mainstay of treatment for cholera due to the large volume of fluid loss that can occur. Treatment with antibiotics may shorten the term or lessen the severity of the illness.

Cholera – Frequently Asked Questions (FAQ)

What is cholera?

Cholera is a bacterium (germ) that may intentionally be used (bioterrorism) to contaminate food or water sources. The bacterium may then be ingested (eaten) and cause severe fluid loss.

Can I get cholera from an infected person?

The infection is most likely spread through contaminated food or water sources. Rarely, it may be transmitted from an infected person if proper personal sanitation is not followed.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and whether you ate or drank contaminated substances. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start as soon as a few hours to as long as several days after exposure to the germ. Many people who were exposed to the germ will show no symptoms at all.

What are the symptoms of infection?

The most common symptoms of cholera infection is severe and sudden onset of vomiting with little or no abdominal pain and no fever. Severe watery diarrhea will follow. Both of these symptoms may lead to a large loss of fluids, and can result in dehydration.

How is the infection treated?

The best way to treat the infection is to replace the fluids that you will lose through vomiting and diarrhea. This can be done either through an IV if you are in the hospital or by drinking large amounts of fluids, especially water and sports drinks (Gatorade). If you have the infection, your health care provider (doctor or nurse) may also give you an antibiotic to help shorten the duration of the infection.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you may be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

The local health officer will make frequent announcements to give you the most current information. You should continue taking the antibiotic for as long as your doctor or nurse has prescribed it for.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS CHOLERA

In the event of an intentional release of the organism that causes **Cholera**, many people may require hospitalization within a few days of exposure. Do not attempt to care for anyone at home who shows symptoms of cholera. If you or any member of your family has or develops any of the following symptoms, go to the nearest hospital emergency room immediately:

- Sudden onset of vomiting with little or no abdominal pain and no fever
- Profuse diarrhea that is very watery

If you do not have any symptoms, you should practice good personal hygiene as follows:

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with any sick individual.
- Wash soiled clothing and bed linens in warm water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet.

Please listen to local radio or television stations for continual updates on this public health emergency.
Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

References

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PLAGUE – Fact Sheet

ALL SUSPECT CASES OF PLAGUE SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- Caused by the bacterium *Yersinia pestis*
- Highly infectious after aerosolization resulting in pneumonic plague
- Person to person and animal to person transmission can occur via respiratory droplet
- Acquired naturally most often through the bite of a flea which previously fed on an infected rodent

Clinical Signs and Symptoms:

- Incubation period of 1-3 days, ranging up to 7 days
- Naturally presents as localized abscess with the secondary formation of large regional lymph nodes known as buboes (bubonic plague), spreading to the central nervous system, lungs, and elsewhere
- Pneumonic plague will present with high fever, chills, headache, malaise, and a productive cough-first watery then bloody, progressing to shock and death
- Fatal in almost 100% of untreated cases due to respiratory failure and circulatory collapse

Laboratory Diagnosis:

- **All lab specimens and bacterial cultures should be handled in a Biosafety Level 2 Laboratory.**
- Wright, Giemsa, or Wayson stains show gram negative coccobacilli with bipolar “safety-pin” appearance
- Grows slowly (48 hours) on standard blood or MacConkey agar
- Immunofluorescent staining for capsule (F1 antigen) is diagnostic

Patient Isolation:

- Strict respiratory isolation with droplet protection (gloves, mask, gown, eye protection) until patient has received 48 hours of antibiotic treatment and shows clinical improvement
- Extreme care must be taken when draining lymph nodes to avoid aerosolization of infectious material

Treatment:

- Streptomycin or Genamicin are the preferred antibiotics
- Doxycycline is an alternative treatment
- Chloramphenicol should be added in cases of plague meningitis

Prophylaxis:

- Antibiotic prophylaxis is recommended for all persons either exposed to the aerosolized bacteria or in close personal contact with a confirmed case
- Doxycycline is the recommended prophylactic antibiotic and should continue for 7 days following the last exposure to a case

PLAGUE – OVERVIEW

EPIDEMIOLOGY

Plague is a disease caused by the Gram negative bacterium *Yersinia pestis*. It is a zoonotic disease of rodents and can be transmitted to humans by the bite of flea vectors, by respiratory droplets from the rodents, or by direct contact with fluids or tissue of an infected animal. Plague may also be transmitted through domestic cats. Transmission of pneumonic plague from person to person is possible through respiratory droplets.

Rodent plague is endemic in parts of Asia, Africa, South America, and the southwest United States (New Mexico, Arizona, Colorado, and California). Plague is generally considered a rural disease where cases may occur in small clusters or as an isolated case.

An infection with plague will present clinically as one of three forms: bubonic, pneumonic, or septicemia. In the event of a bioterrorist incident, the most likely presentation will be the pneumonic form as a result of aerosolization and release of the bacteria.

CLINICAL MANIFESTATION

Primary Pneumonic: Has an incubation period of 1-3 days but can be up to 7 days after exposure.

Presents as acute onset of high fever, malaise, chills, headache, and productive cough-first watery then bloody. This is followed by shock and respiratory collapse leading to death. In untreated cases, plague has almost a 100% fatality rate due to respiratory and circulatory collapse.

Bubonic: Has an incubation period of 2-10 days.

Presents as localized abscess with the secondary formation of large regional lymph nodes known as buboes. Infection will spread to the central nervous system, lungs, and elsewhere. Symptoms may also include malaise, high fever, and tender lymph nodes.

Primary Septicemia Plague: The less common form of the disease has an incubation period of 1-7 days.

Presents as fever often accompanied by malaise, headache, GI disturbances, and chills. May progress to septic shock, consumptive coagulopathy, meningitis, and coma. If untreated, secondary pneumonic plague may develop.

DIAGNOSIS

Primary diagnosis should be made upon clinical signs and symptoms.

All laboratory work should be performed in a Biosafety Level 2 facility. Laboratory personnel must wear surgical gloves, protective gowns, and shoe covers. Blood cultures must be maintained in closed systems. A face mask or protective eye wear should be worn if the possibility of creating a splash or aerosol exists.

Appropriate specimens for staining and culturing *Y. pestis* include blood, bubo aspirates, sputum, skin scrapings, and CSF (if meningitis exists). *Yersinia pestis* grows slowly (48 hrs) on blood and MacConkey agars and in infusion broth, therefore rapid biochemical systems may not be able to identify the organism.

The organism will be Gram negative cocco-bacilli with a bipolar staining “safety pin” appearance. Wayson stain will show a light blue bacilli with dark blue polar bodies on a pink background. Immunofluorescent staining of the F1 capsule will be diagnostic, but new cultures must be used to avoid a false negative.

Serology tests are also available, including a passive hemagglutination test. A single titre of >1:16 in a person without prior immunization is suggestive of infection, and a fourfold or greater rise is diagnostic.

ISOLATION / DECONTAMINATION

Standard precautions are recommended for all patients with plague, and respiratory isolation with droplet precautions are recommended for patients with pneumonic plague.

Plague is highly contagious in droplet form, therefore it is recommended that patients be placed in private rooms and that all persons entering the room wear a surgical mask, especially if the person entering the room will be within three feet of the patient. Droplet precautions should be continued until 48 hours after initiation of treatment and the patient shows signs of clinical improvement.

Multiple patients with the same diagnosis of pneumonic plague can be cohorted if proper treatment is being given to all patients.

Medical waste should be disposed of following standard procedures. All biohazardous waste should be autoclaved.

Autopsy/Handling of Corpses: All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

Supportive care combined with antibiotic treatment are keys to successfully managing plague. Fatality rates for pneumonic plague approaches 100% if treatment with antibiotics is not begun within 24 hours of symptom onset.

See treatment/prophylaxis tables.

Streptomycin is the antibiotic of choice for treating pneumonic plague. If streptomycin is in short supply, Gentamicin, Doxycycline, and Ciprofloxacin are the best alternative choices for treatment. If plague meningitis is also present, Chloramphenicol is recommended in addition to the other listed treatments. All treatments should be continued for 10 – 14 days.

When prophylacting, antibiotics should be continued for 7 days following exposure.

VACCINE

A whole-cell inactivated vaccine is available, but is generally warranted only for those whose occupation places them at high risk for exposure. The vaccine has also appeared to offer little or no protection against pneumonic plague.

Plague Treatment and Prophylaxis Protocol

	Treatment	Prophylaxis
Adults	Streptomycin ¹ 1 g IM q 12 hr x 10 d ² OR	Doxycycline 100 mg PO bid x 7 d past last exposure
	Gentamycin 3-5 mg/kg/d IV or IM x 10 d ² OR	
	Doxycycline 100 mg IV bid x 10 d ² OR	
	Doxycycline 100 mg PO bid x 10 d	
Pediatric	Gentamicin 6-7.5 mg/kg/d in 3 divided doses x 10 d ²	Doxycycline ³ : >8 yrs and >45 kg: 100 mg PO x 10 d ² >8 yrs and <45 kg: 2.2 mg/kg PO x 10d ² <8 yrs: same as >8 yrs and <45 kg
	Doxycycline ³ : >8 yrs and >45 kg: 100 mg IV or PO x 10 d ² >8 yrs and <45 kg: 2.2 mg/kg IV or PO x 10d ² <8 yrs: same as >8 yrs and <45 kg	
Pregnancy	Same as for non-pregnant adults.	
Immuno-compromised	Same as for non-immunocompromised adults and children	

1. Streptomycin is the treatment of choice. It may be difficult to obtain; therefore Gentamicin can be used as the drug of choice and appears to be as effective.
2. Treatment should be switched to oral Doxycycline when clinically appropriate and continued to complete the 10 day treatment.
3. Doxycycline is included in a recommendation amendment by the American Academy of Pediatrics to allow the use of tetracyclines in young children for the treatment of serious infections.

Plague – Frequently Asked Questions (FAQ)

What is plague?

Plague is a bacterium (germ) that may intentionally be released into the air (bioterrorism) and breathed (inhaled) into people's lungs causing severe respiratory distress. The germ is naturally found in some mammals, especially rodents such as mice and squirrels, and can be spread to humans through the bite of a flea from an infected animal.

Can I get plague from an infected person?

You can get plague from an infected person. An infected person may spread the disease through breathing, laughing, or talking. If you are in contact with an infected person, you should wear respiratory protection such as a surgical mask.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop?

If the germ were intentionally released into the air, symptoms may start from 1 – 7 days after exposure to the germ. If you were bitten by an infected flea, symptoms may take as long as 10 days to develop.

What are the symptoms of infection?

If you have inhaled the germ, you may develop some of the following symptoms: sudden onset of high fever, chills, headache, and a watery or bloody cough. Plague is a very serious infections, and should be treated as a medical emergency. If you feel you were exposed to the germ that causes plague and develop the symptoms listed, go to the emergency room immediately.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will give you an antibiotic. You will also be closely monitored to ensure that proper medical care is given to you.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If

you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

The local health officer will make frequent announcements to give you the most current information. You should continue taking the antibiotic for as long as your doctor or nurse has prescribed it for.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS PLAGUE

In the event of an intentional release of the organism that causes Plague, many people may require hospitalization within a few days of exposure. Hospitals may quickly become overwhelmed and unable to take care of every person who seeks treatment. For this reason, some sick people may have to be cared for in their home by relatives or friends. The following information may be helpful to those providing care to the sick.

- Advise friends and relatives not to visit until the sick person is feeling better.
- Wear a mask over your nose and mouth when you are in close contact with the infected person.
- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with the sick individual.
- Wear vinyl or latex gloves when you have the potential to contact the sick person's blood or other bodily fluid (urine, feces, vomit, wound drainage, mucous, saliva). Wash your hands with soap and water after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood or other bodily fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is prescribed, give it exactly as prescribed by the doctor. If an allergic reaction occurs, seek medical advice immediately.
- Take the person's temperature at least two times a day. If the temperature rises about 100° F give Tylenol or other medicine such as Motrin or Advil. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, seek medical advice or take the person to the nearest designated emergency center or hospital.
- If the person develops breathing problems, go immediately to the nearest designated emergency center or hospital.
- Give the sick person plenty of fluids such as water and juice. Allow the person to eat solid food as it is tolerated.
- Change the sick person's clothing and bed linens often, especially if they become soiled with blood or bodily fluids.
- Wash soiled clothing and bed linens in warm water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet. Even if you are not taking an antibiotic, take your own temperature in the morning and afternoon for one month. If you develop a fever above 100° F or if you have flu-like symptoms, seek medical attention immediately.

Please listen to local radio or television stations for continual updates on this public health emergency.
Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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Q FEVER – Fact Sheet

ALL SUSPECT CASES OF Q FEVER SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- Caused by the rickettsia *Coxiella burnetii*, a zoonotic disease
- Person to person transmission rarely occurs
- Infection could be caused by as few as 1-10 organisms
- Typically caused by the aerosolization of infected soil or animal products

Clinical Signs and Symptoms:

- Incubation period is 2-14 days
- Fever, severe headache, fatigue, chills, sweating, myalgias, vomiting, nausea, diarrhea, and chest pain; pneumonia can occur as well
- Acute hepatitis with jaundice and splenomegaly can occur
- Illness lasts 2 days to 2 weeks

Diagnosis:

- Cultivation of the organism requires extreme care due to the ready aerosolization and low infective dose of the organism
- Blood tests should be used to confirm the diagnosis

Patient Isolation:

- Standard precautions are recommended
- Isolation is not required

Treatment:

- Generally self-limiting and resolves without treatment
- Tetracycline and Doxycycline are the treatments of choice
- Ciprofloxacin or another quinolone may be given if complications exist from Tetracycline or Doxycycline
- Treatment should continue for at least 5 – 7 days after exposure

Prophylaxis:

- Tetracycline, Doxycycline, or a quinolone should be started 8-12 days following exposure if prophylaxis is recommended

Q FEVER – OVERVIEW

EPIDEMIOLOGY

Q Fever is caused by the rickettsia *Coxiella burnetii*.

Infection is endemic in animals, including some domestic mammals (sheep, goats, cows, cats, dogs) and some wild and domestic birds. Animals are usually asymptomatic but shed large amounts of the organism in the placenta during and after birthing. Ticks may be an animal reservoir for the organism.

The infectious dose can be as little as 1-10 organisms.

The disease is typically acquired through the aerosolization of the organism from infected materials, but can also be acquired through handling of placental tissue. It is common among farm workers, veterinarians, and laboratory technicians who handle animals.

Transmission from person to person rarely, if ever, occurs.

A bioterrorist incident would most likely involve the aerosolization of the organism and would be used as an incapacitating agent due to its low mortality rate of 1-3%.

CLINICAL MANIFESTATION

Q fever typically presents as a non-specific illness. Sudden onset of fever, chills, weakness, headache and anorexia are common, as well as other non-specific systemic symptoms. Approximately half of patients develop pneumonia with cough and chest pain. Hepatomegaly is frequently noted.

Q fever will generally resolve without the need for antibiotics. The disease can last from 2 days to 4 weeks.

Major complications of the disease can include hepatitis and endocarditis. Mortality of patients with endocarditis will range from 30-60%.

DIAGNOSIS

Due to the low infectious dose needed to cause disease, it is recommended that cultivation of the organism not be performed. Some reference and research laboratories are able to confirm the diagnosis of the disease by way of immunoassays and/or polymerase chain reaction.

Diagnosis should be made on clinical judgment including history, and should be confirmed by blood tests.

ISOLATION / DECONTAMINATION

Patient isolation is not recommended. Standard precautions are recommended.

TREATMENT / PROPHYLAXIS

Q fever is generally a self-limiting disease.

Treatment and prophylaxis can include tetracycline or Doxycycline administered orally.

See treatment/prophylaxis tables.

VACCINE

A vaccine is available for use in Australia, but skin testing prior to administration is warranted due to severe local reactions that may result in those who are already immune.

Q Fever Treatment and Prophylaxis Protocol

	Treatment	Prophylaxis
Adults	Doxycycline 100 mg PO q 12 h x 5-7 d continued at least 2 d after afebrile	Doxycycline 100 mg PO q 12 h x 5 d (start 8-12 d post exposure)
	Tetracycline 500 mg PO q 6 h x 5-7 d continued at least 2 d after afebrile	Tetracycline 500 mg PO q 6 h x 5 d (start 8-12 d post exposure)
Pediatric	Doxycycline ² : >8 yrs and >45 kg: 100 mg IV or PO x 10 d ² >8 yrs and <45 kg: 2.2 mg/kg IV or PO x 10d ² <8 yrs: same as >8 yrs and <45 kg	Doxycycline ² : >8 yrs and >45 kg: 100 mg PO x 10 d ² >8 yrs and <45 kg: 2.2 mg/kg PO x 10d ² <8 yrs: same as >8 yrs and <45 kg
Pregnancy	Same as for non-pregnant adults.	
Immuno-compromised	Same as for non-immunocompromised adults and children	

1. Q Fever is generally a self limiting disease and resolves itself without treatment.
2. Doxycycline is included in a recommendation amendment by the American Academy of Pediatrics to allow the use of tetracyclines in young children for the treatment of serious infections.

Q fever – Frequently Asked Questions (FAQ)

What is Q fever?

Q fever is a bacterium (germ) that may intentionally be released into the air (bioterrorism) and breathed (inhaled) into people's lungs. Infection with the germ can cause severe flu-like symptoms.

Can I get Q fever from an infected person?

The infection is NOT readily spread from person to person.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms typically begin from 2-14 days after exposure to the germ. In some cases it may take up to 40 days for symptoms to develop.

What are the symptoms of infection?

Most of the symptoms that you will have will be non-specific and resemble the flu. Sudden onset of fever, chills, weakness, headache, muscle pain, and loss of appetite are common. Some patients will develop pneumonia with chest pain and cough. Some patients will have jaundice (yellowed skin).

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) may give you an antibiotic. Most of the time your body will be able to fight the infection without antibiotics.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

The local health department will make frequent announcements to give you the most current information. You should continue taking the antibiotic for as long as your doctor or nurse has prescribed it for.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS Q FEVER

In the event of an intentional release of the organism that causes Q Fever, many people may require hospitalization within a few days of exposure. Hospitals may quickly become overwhelmed and unable to take care of every person who seeks treatment. For this reason, some sick people may have to be cared for in their home by relatives or friends. The following information may be helpful to those providing care to the sick.

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with the sick individual.
- Wear vinyl or latex gloves when you have the potential to contact the sick person's blood or other bodily fluid (urine, feces, vomit, wound drainage, mucous, saliva). Wash your hands with soap and water after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood or other bodily fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is prescribed to the sick person, give it exactly as prescribed by the doctor. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least two times a day. If the temperature rises about 100° F give Tylenol or other medicine such as Motrin or Advil. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, seek medical advice or take the person to the nearest designated emergency center or hospital.
- If the person develops breathing problems, go immediately to the nearest designated emergency center or hospital.
- Give the sick person plenty of fluids such as water and juice. Allow the person to eat solid food as it is tolerated.
- Change the sick person's clothing and bed linens often, especially if they become soiled with blood or bodily fluids.
- Wash soiled clothing and bed linens in warm water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet. Even if you are not taking an antibiotic, take your own temperature in the morning and afternoon for one month. If you develop a fever above 100° F or if you have flu-like symptoms, seek medical attention immediately.

Please listen to local radio or television stations for continual updates on this public health emergency.

Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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SMALLPOX – Fact Sheet

ALL SUSPECT CASES OF SMALLPOX SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24-Hour Pager 579-1920

Epidemiology:

- Highly infectious in aerosol or droplet form. Person to person transmission is high, and the virus can also be spread by contaminated clothing or bed linens.
- Certified as eradicated by WHO in 1979, last naturally occurring case in 1977.
- Approximately 30% of susceptible contacts to case will become infected.

Clinical Signs and Symptoms:

- Incubation period of 12-14 days (range 7-17 days).
- Acute manifestations include general flu-like symptoms (fever, malaise, vomiting, headache).
- Maculopapular rash begins on mucosa of mouth and pharynx, face, hands, forearms, and spreads to legs and centrally to trunk. Lesions are more predominant on face and extremities than the trunk.
- Lesions will progress from macules to papules to vesicles to pustules to crusty scabs.

Laboratory Diagnosis:

- **All lab specimens must be handled in a Biosafety Level 4 Laboratory.**
- Diagnosis is made by evaluation of vesicular fluid with electron microscopy and cell culture.

Patient Isolation:

- Strict isolation in a negative pressure room from onset of rash until all scabs separate (high efficiency particulate air filtration is ideal).
- Persons obtaining lab specimens should wear mask and gloves and should be vaccinated.
- Laundry and waste should be autoclaved before being laundered or incinerated.

Treatment:

- Supportive care is the mainstay of therapy.
- Antiviral activity against poxviruses has been demonstrated in-vitro with adefovir, cidofovir, dipivoxil, and ribavirin (cidofovir may be most effective).

Prophylaxis:

- Smallpox vaccine required for all exposed persons or anyone with a close personal contact with a smallpox case.
- **All persons who were in the hospital from the time the case enters the hospital to the time case is placed in negative pressure room should be vaccinated.**
- Vaccine is most effective if given prior to or within 3 days of exposure.
- Ideally all persons who are exposed should be strictly quarantined for 17 days after last known contact with a smallpox case.

SMALLPOX – OVERVIEW

EPIDEMIOLOGY

Smallpox is caused by the variola virus, a member of the Orthopox family. It is a large, enveloped DNA virus. The last naturally occurring case of smallpox occurred in Somalia in 1977. The World Health Organization declared the disease eradicated in 1979; this was confirmed by the World Health Assembly in 1980. There are currently 2 official stocks of the disease in the world: one in the United States and one in Russia. There are thought to be other stocks as well.

Vaccination for the disease in the United States was discontinued in 1972 for the general population. It is thought that immunity from the smallpox vaccine decreases over time, and that at this point, the entire U.S. civilian population is susceptible to the disease. Mortality rates for vaccinated and unvaccinated are 3% and 30%, respectively.

Smallpox is very infectious and is transmitted from person to person primarily by way of respiratory droplet. Patients should be considered contagious from the onset of enanthem until all scabs separate. Humans are the only host for the virus, and no animal reservoirs exist. While the disease was endemic, approximately 30% of case contacts contracted the disease.

The virus can exist outside of a host for some time. Fomites and inanimate objects are considered to be potential modes of transmission for the virus. Laundry and linens from infected patients should be autoclaved prior to cleaning in order to kill the virus.

Persons in contact with a confirmed case of smallpox should be placed in strict quarantine for 17 days. Patients with a confirmed or suspected case of smallpox should be placed in strict isolation until no longer considered infectious.

In the event of a bioterrorist incident, it is thought that the smallpox virus will be delivered via aerosol. The virus is easy to produce, is highly infectious and highly stable

in the aerosol form. There is a low infectious dose and a high mortality rate in those who are not immunized. Supplies of the smallpox vaccine are currently limited worldwide. Infection could continue through the population by way of secondary infection if the cases are not identified in a prompt manner.

CLINICAL MANIFESTATION

Incubation period for the disease typically ranges from 7-19 days. Commonly, a fever will begin 10-14 days after exposure, then 2-4 days more before a rash appears.

Symptoms of typical variola major infection will begin with a sudden onset of fever, malaise, rigors, backache, headache, and possibly vomiting and abdominal pain. Fever will begin to wane after 2-4 days.

Onset of rash begins as fever falls. Lesions will typically begin to form on the head and distal extremities as well as on the oropharynx (centrifugal rash). Lesions may also be present on the soles of the feet and palms of the hands. The lesions will then move onto the trunk area. Lesions typically follow the following stages: macules, papules, vesicles, pustules, and crusted scabs. Scabs typically form in 8-14 days and will leave deep depigmented scars when they fall off in 2-3 weeks.

The most common differential diagnosis for smallpox is chickenpox. There are several distinguishing characteristics:

- Smallpox lesions occur more prominently on the face and extremities (centrifugal); chickenpox lesions more prominent on the trunk (centripetal).
- Smallpox lesions are in similar developmental stages throughout the body; chickenpox lesions are in different stages on similar body parts.
- Smallpox lesions are usually deeply imbedded in the dermis; chickenpox lesions are typically superficial.
- Smallpox lesions are more common on palms and soles of feet than chickenpox lesions.

There are also several variations of the variola major smallpox clinical presentations:

Flat type “malignant” smallpox – this variation occurs in approximately 2-5% of cases. It is caused by a lack of cell mediated immune response of the host. The most notable feature of this variation is severe systemic toxicity and a slow evolution of flat, soft, focal skin papules that never progress to become pustular. The skin of the patient will develop a fine-grain reddish color. The mortality rate in unvaccinated patients with this variation is 95%.

Hemorrhagic type smallpox – this variation occurs in less than 3% of cases. Intense toxemia with headache, fever, backache and abdominal pain will be notable, as will petechia and mucosal hemorrhage. This variation is seen more often in pregnant women, and most patients die prior to developing lesions.

Another type of smallpox is caused by the variola minor virus. This virus has a typical incubation period of 7-17 days. Clinically, it mirrors the variola major virus except for milder symptoms and toxicity, and sometimes diminutive pox lesions. Lesions on the face typically are more sparse and evolve more rapidly than lesions on the extremities. Mortality in unvaccinated patients is approximately 1%.

DIAGNOSIS

Diagnosis of smallpox should be based on the clinical findings of the disease including history. If a single case of smallpox is suspected, it must be treated as an international health emergency.

Diagnosis of smallpox should be confirmed by electron microscopy of pustular or vesicular fluid. Collection of samples should be performed by a person who has recently been vaccinated. Fluid for microscopy should be obtained by opening a lesion with the blunt edge of a scalpel, then harvesting the fluid with a cotton swab. The scab may also be removed with forceps. All specimens should be placed in a vacutainer tube. The tube should then be sealed with tape. The sealed tube should then be placed in a watertight container for shipment to a proper facility. Shipping should be performed only after

contacting the appropriate lab or state/federal officials to determine the proper shipping requirements. Specimens will be examined by electron microscopy for confirmation of smallpox virus. Virus cultures may also be grown on chorioallantoic membrane or in cell culture. Other methods for identification of the virus include PCR and restriction fragment length polymorphisms.

All laboratory work must be performed in a Biosafety Level 4 (BSL 4) Laboratory (CDC or USAMRIID). In addition, all laboratory personnel should be vaccinated against the smallpox virus.

ISOLATION / DECONTAMINATION

Smallpox is highly transmissible person to person through exposure to respiratory excretions, open lesions, and fomites.

Patients with suspected or confirmed smallpox should be confined in a negative pressure room with HEPA filtration, if possible. Patients should be placed on strict isolation from the time of eruptive exanthem until all scabs have separated (up to 28 days). If a large scale outbreak occurs, it may be necessary to cohort patients to save space. If this occurs, all patients who are cohorted should receive the smallpox vaccine or vaccine immune globulin within 3 days of exposure in the event that some cases were misdiagnosed.

Staff who are in contact with smallpox patients should observe standard, respiratory, and contact precautions. When entering a room with a smallpox case, respiratory masks meeting the minimum NIOSH standard should be worn (N95). Clean gloves and gowns should also be worn. In addition, all staff that are in contact with smallpox patients should be vaccinated.

Decontamination of infectious waste should be performed using the same rules and regulations as other medical waste.

Autopsy/Handling of Corpses: All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in

an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

Supportive care is the most important mode of treatment that is available at this time. There are antiviral drugs available, however none have been proven to be effective against the virus. Cidofovir has shown the most promise in animal models, and is licensed by the FDA.

Any exposed person should be administered the smallpox vaccine within three days of exposure. This includes all close personal contacts with a suspected or confirmed case after the case developed a febrile illness. In addition, all exposed persons should be placed in quarantine for 17 days following exposure to a suspected or confirmed case. Quarantine may be done at the person's home during a large scale outbreak or bioterrorist incident.

VACCINE (UPDATED – JANUARY 2003)

One potential danger to America is the use of the smallpox virus as a weapon of terror. On December 13, 2002, President Bush announced a new smallpox vaccination program. Given the inherent health risks of the vaccine, the Bush Administration has decided not to initiate a broader vaccination program for all Americans at this time. Nevertheless, the Kansas Department of Health and Environment (KDHE) in collaboration with the CDC, is prepared to begin the process of vaccinating health care workers against smallpox. All smallpox vaccinations will be voluntary in keeping with the National Smallpox Vaccination Plan approved by President Bush.

Following the strategy indicated by the CDC, the first phase of the voluntary smallpox vaccinations will include public health response team members called upon to investigate a smallpox incident, and high-risk health care workers including hospital emergency room staff. The second phase of vaccinations will include additional health care workers and emergency first responders including EMS and ambulance workers.

The vaccinations for health care workers will happen in several clinics to be held throughout Kansas in early 2003. The locations, dates and times of those clinics have yet to be finalized, but will be announced when plans are final.

The Kansas Department of Health and Environment worked with the Kansas Hospital Association, local health departments, and other health officials in developing the Pre-Event Smallpox Plan that outlines the procedures described above. The plan was submitted to the Centers for Disease Control on December 9, 2002.

Addendum A- Guidelines for Management of a Suspect Case of Smallpox in Acute Care Medical Settings in Kansas. (PDF).

Smallpox – Frequently Asked Questions (FAQ)

What is smallpox?

Smallpox is a virus that may intentionally be released into the air (bioterrorism) and breathed (inhaled) causing severe sickness with a rash that looks much like chickenpox. This disease has been considered extinct as a naturally occurring disease since 1980.

Can I get smallpox from an infected person?

Smallpox is highly infectious from person to person. If you know someone who has smallpox, you should avoid seeing them for several weeks.

How will I know if I was exposed to smallpox?

It will depend on how the virus is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start from 7-17 days after exposure to the virus.

What are the symptoms of infection?

The disease will begin with flu-like symptoms such as fever, headache, and muscle aches. You will then develop a rash in your mouth and throat, face, hands, and forearms. The rash will spread to your legs and trunk. The rash will appear much like the rash that develops when you have chickenpox.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) may give you the vaccine, and, depending on the severity of your illness, may require you to be hospitalized to provide care during the illness.

How is the infection prevented?

If the local health officer determines that you were exposed to the virus, you may be offered a vaccine. Even if you receive the vaccine, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS SMALLPOX

In the event of an intentional release of the organism that causes Smallpox, many people may require hospitalization within a few days of exposure. Hospitals may quickly become overwhelmed and unable to take care of every person who seeks treatment. For this reason, some sick people may have to be cared for in their home by relatives or friends. The following information may be helpful to those providing care to the sick.

- Listen closely to local radio or television for special instructions from the local health department.
- Advise friends and relatives not to visit.
- Wear a mask over your nose and mouth when you are within 6 feet of the infected person.
- Wear a plastic gown or apron to protect your clothes from becoming soiled with blood or other bodily fluids.
- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with the sick individual.
- Wear vinyl or latex gloves when you have the potential to contact the sick person's blood or other bodily fluid (urine, feces, vomit, wound drainage, mucous, saliva). Wash your hands with soap and water after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood or other bodily fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- Take the person's temperature at least two times a day. If the temperature rises about 100° F give Tylenol or other medicine such as Motrin or Advil. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, seek medical advice or take the person to the nearest designated emergency center or hospital.
- If the person develops breathing problems, go immediately to the nearest designated emergency center or hospital.
- Give the sick person plenty of fluids such as water and juice. Allow the person to eat solid food as it is tolerated.
- Change the sick person's clothing and bed linens often, especially if they become soiled with blood or bodily fluids.
- Wash soiled clothing and bed linens in hot water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet. Even if you are not taking an antibiotic, take your own temperature in the morning and afternoon for one month. If you develop a fever above 100° F or if you have flu-like symptoms, seek medical attention immediately.

Please listen to local radio or television stations for continual updates on this public health emergency.
Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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TULAREMIA – Fact Sheet

ALL SUSPECT CASES OF TULAREMIA SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- Caused by the bacterium *Francisella tularensis*
- Highly infectious after aerosolization
- Person to person transmission does not occur
- Infectious dose can be as low as 10-15 organisms
- Endemic in North America, naturally acquired through the bites of certain insects or through contact with infected animals

Clinical Signs and Symptoms:

- Incubation period of 1-3 days (range 1-21 days)
- Six classic forms of tularemia may overlap
- Pneumonic: fever, chills, headache, malaise, myalgia, unproductive cough, abdominal pain
- Systemic: fever, chills, myalgia, sore throat, nausea, vomiting, abdominal pain, loose or watery diarrhea
- Diagnosis relies on high degree of clinical suspicion for nonspecific symptoms

Laboratory Diagnosis:

- **All lab specimens and bacterial cultures should be handled in a Biosafety Level 3 Laboratory.**
- Organism is difficult to culture and grows slowly using standard types of media; cysteine-enriched media is required
- Serology is the most common tool for diagnosis

Patient Isolation:

- Standard precautions recommended

Treatment:

- Streptomycin or Gentamicin for 10-14 days are the preferred antibiotics
- Tetracyclines are an alternative choice, but they are associated with a higher rate of relapse and must be continued for 14 days

Prophylaxis:

- Antibiotic prophylaxis are most effective if started within 24 hours of exposure
- Tetracyclines are recommended for 14 days

TULAREMIA – OVERVIEW

EPIDEMIOLOGY

Tularemia is a disease caused by an infection with the Gram negative bacterium *Francisella tularensis*. It is endemic to much of North America and can also be found in parts of Europe and Asia. Tularemia is not naturally present in Australia.

Tularemia is generally acquired through the bite of a vector (ticks, deerflies, mosquitos) or through contact with infected mammals, both wild (rabbits, muskrats, beavers) and domestic (sheep, cattle, cats). Rabbits are the most common host associated with the disease in the United States, and ticks are the most common vectors. The disease is more common in children during the summer when ticks and deerflies are abundant, and in adults in early winter during rabbit season.

A terrorist related incident would probably involve the aerosolization and dissemination of living bacteria, presumably resulting in a greater mortality rate than naturally acquired tularemia. If inhaled, the infectious dose of tularemia can be as few as 10-50 organisms.

Tularemia is not transmitted person to person.

CLINICAL MANIFESTATION

A bioterrorist event would most likely involve the aerosolization of living organisms, resulting in a presentation of typhoidal tularemia.

Typhoidal Tularemia: Incubation period would be from 3-6 days with a range of 1-21 days.

Presentation would be an acute, febrile nonspecific illness. Common symptoms would include headache, myalgias, sore throat, anorexia, nausea, vomiting, diarrhea, abdominal pain, and cough. Patients may also develop hypotension, adult respiratory distress, renal failure, disseminated intravascular coagulation and shock. The mortality rate for untreated typhoidal tularemia is 30-60%.

Ulceroglandular Tularemia: Same incubation period as typhoidal. Generally results from inoculation of the organism into the skin or mucous membrane.

A papule will develop at the site of inoculation, and will progress to an ulcer within a few days. Tender enlarged lymph nodes will most likely be present, and may drain spontaneously and last for months or years. Other symptoms may include fever, chills headache, and malaise. Fatality rate for untreated ulceroglandular tularemia is approximately 5%.

DIAGNOSIS

All laboratory work should be performed in a Biosafety Level 3 facility. Tularemia is infectious at very low doses. Laboratory personnel should take great care when handling this organism.

The diagnosis of tularemia usually involves a high level of clinical suspicion due to the nonspecific symptoms that are common with the disease and because the organism grows slowly on standard blood cultures.

Recovery of the organism can be made from blood, ulcers, sputum, conjunctival exudates, pleural fluid, lymph nodes, and pharyngeal exudates.

Cultures do not grow well on standard blood media. When grown on cysteine enriched media, it will form small, smooth, opaque colonies. It may also grow on chocolate agar. The bacteria grows slowly, sometimes taking up to 4-6 weeks.

Antibody detection assays may be able to help confirm suspected cases, but significant antibody titers may not exist until several weeks into the infection. A single titre of >1:160 is presumptive positive, while a fourfold rise is required for definitive diagnosis. Antibodies may cross react with *Brucella* spp., *Proteus* OX19, and *Yersinia* spp.

ISOLATION / DECONTAMINATION

Standard precautions should be followed. Ulcers should be covered and care should be taken when contacting lesions.

Decontamination of medical waste should follow standard procedures.

Autopsy/Handling of Corpses: All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

See treatment/prophylaxis tables.

Streptomycin or Gentamicin are recommended treatments. Doxycycline or Ciprofloxacin are alternative therapies. All therapies are recommended for 10-14 days.

VACCINE

A vaccine is not currently available.

Tularemia Treatment and Prophylaxis Protocol

	Treatment	Prophylaxis
Adults	Streptomycin ¹ 1 g IM q 12 hr x 10 d ² OR	Doxycycline 100 mg PO bid x 14 d OR
	Gentamycin 3-5 mg/kg/d IV or IM in 3 divided doses x 7-14 d ² OR	Ciprofloxacin 500 mg PO bid x 14 d
	Doxycycline 100 mg IV bid x 21 d ² OR	
	Ciprofloxacin 400 mg IV bid x 10-14 d OR	
	Doxycycline 100 mg PO bid x 10 d OR	
	Ciprofloxacin 500 mg PO bid x 10-14 d	
Pediatric	Gentamicin 6-7.5 mg/kg/d in 3 divided doses x 10 d ²	Doxycycline ³ : >8 yrs and >45 kg: 100 mg PO x 14 d ² >8 yrs and <45 kg: 2.2 mg/kg PO x 14d ² <8 yrs: same as >8 yrs and <45 kg
	Doxycycline ^{2,3} : >8 yrs and >45 kg: 100 mg IV x 10 d ² >8 yrs and <45 kg: 2.2 mg/kg IVx 10d ² <8 yrs: same as >8 yrs and <45 kg	
	Ciprofloxacin ⁴ 15 mg/kg IV or PO q 12 h x 10-14 d	Ciprofloxacin ⁴ 15-20 mg/kg PO bid x 14 d
Pregnancy	Same as for non-pregnant adults.	
Immuno-compromised	Same as for non-immunocompromised adults and children	

1. Streptomycin is the treatment of choice. It may be difficult to obtain; therefore Gentamicin can be used as the drug of choice and appears to be as effective.
2. May switch to oral Doxycycline when clinically appropriate. When switch is made, therapy should continue for a total duration of 21 days.
3. Doxycycline is included in a recommendation amendment by the American Academy of Pediatrics to allow the use of tetracyclines in young children for the treatment of serious infections.
4. Ciprofloxacin dose should not exceed 1 gram per day in children.

Tularemia – Frequently Asked Questions (FAQ)

What is tularemia?

Tularemia is a bacterium (germ) that may intentionally be released into the air (bioterrorism) and breathed (inhaled) into people's lungs causing severe medical complications. The germ can also be transmitted through the bite of an infected flea, tick, or fly, or by contact with an infected animal.

Can I get tularemia from an infected person?

The infection is NOT spread from person to person.

How will I know if I was exposed to the germ?

It will depend on how the germ is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start from 1-21 days after exposure to the germ.

What are the symptoms of infection?

If the germ invades your lungs, you may have a fever, headache, sore throat, loss of appetite, sore muscles, nausea, vomiting, diarrhea, abdominal pain, and cough. You may also develop respiratory complications and other serious medical conditions. If you have any of these symptoms and believe that you have been exposed to tularemia, contact your health care provider or emergency room immediately.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health officer determines that you were exposed to the germ, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

The local health department will make frequent announcements to give you the most current information. You should continue taking the antibiotic for as long as your doctor or nurse has prescribed it for.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS TULAREMIA

In the event of an intentional release of the organism that causes Tularemia, many people may require hospitalization within a few days of exposure. Hospitals may quickly become overwhelmed and unable to take care of every person who seeks treatment. For this reason, some sick people may have to be cared for in their home by relatives or friends. The following information may be helpful to those providing care to the sick.

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with the sick individual.
- Wear vinyl or latex gloves when you have the potential to contact the sick person's blood or other bodily fluid (urine, feces, vomit, wound drainage, mucous, saliva). Wash your hands with soap and water after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood or other bodily fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is prescribed to the sick person, give it exactly as prescribed by the doctor. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least two times a day. If the temperature rises about 100° F give Tylenol or other medicine such as Motrin or Advil. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, seek medical advice or take the person to the nearest designated emergency center or hospital.
- If the person develops breathing problems, go immediately to the nearest designated emergency center or hospital.
- Give the sick person plenty of fluids such as water and juice. Allow the person to eat solid food as it is tolerated.
- Change the sick person's clothing and bed linens often, especially if they become soiled with blood or bodily fluids.
- Wash soiled clothing and bed linens in warm water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet. Even if you are not taking an antibiotic, take your own temperature in the morning and afternoon for three (3) weeks. If you develop a fever above 100° F or if you have flu-like symptoms, seek medical attention immediately.

Please listen to local radio or television stations for continual updates on this public health emergency.

Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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VIRAL HEMORRHAGIC FEVERS – Fact Sheet

ALL SUSPECT CASES OF VHF SHOULD BE CONSIDERED A PUBLIC HEALTH EMERGENCY AND MUST BE REPORTED IMMEDIATELY TO THE SEDGWICK COUNTY HEALTH DEPARTMENT
24 Hour Pager 579-1920

Epidemiology:

- Caused by four distinct families of viruses: arenavirus, filovirus, bunyavirus, and flavivirus
- Highly contagious (except for Hantavirus), increasing as the patient's condition deteriorates
- Tissue, blood, and other body fluids should be considered infectious, and the viruses can be aerosolized by a coughing patient
- Most viruses causing VHF are zoonotic

Clinical Signs and Symptoms:

- Incubation period varies from 5 – 42 days depending on the virus
- Target organ is the vascular bed
- Common complaints include fever, myalgias, prostration, hypotension, conjunctival injection, flushing, and petechial hemorrhages
- Symptoms and their degree will vary depending on the virus and the patient

Laboratory Diagnosis:

- **All lab specimens must be handled in a Biosafety Level 4 Laboratory**
- Diagnosis should be based on clinical signs and symptoms
- Electron microscopy will provide definitive diagnosis

Patient Isolation:

- Strict respiratory isolation with droplet protection (respirator, face shield, gown, gloves) should be followed by any person having contact with the patient, including patient's waste, clothing, and linens
- Patient should be placed in a negative pressure room if available; if one is not available, patient should be placed in a private room
- All waste, clothing, and linens should be autoclaved prior to processing

Treatment:

- Supportive care will be the mainstay of therapy
- Care should include fever and pain control, sedation, and hydration

Prophylaxis:

- No prophylaxis are currently available

VIRAL HEMORRHAGIC FEVERS – OVERVIEW

EPIDEMIOLOGY

Viral hemorrhagic fevers are caused by RNA viruses from four different viral families: *Arenaviridae*, *Bunyaviridae*, *Filviridae*, and *Flaviviridae*.

Arenaviridae include the agents of many of the South American hemorrhagic fevers including Argentine, Bolivian, Brazilian, and Venezuelan fevers, as well as Lassa fever, which causes disease in West Africa. These viruses are transmitted to humans from their rodent reservoirs by inhalation of rodent excrement contaminated dust.

Bunyaviridae include the agents of Congo-Crimean hemorrhagic fever (CCHF), Rift Valley fever (RVF), and the Hantavirus, which causes hemorrhagic fever with renal syndrome (HFRS). CCHF occurs in the Crimea as well as parts of Asia, Europe, and Africa and is carried by ticks. RVF occurs in Africa and is carried by mosquitos. The Hantavirus are carried by rodents, transmitted to humans via inhalation of contaminated excrement, and occur with a wide geographic distribution.

Filoviridae include the agents that cause Ebola and Marburg hemorrhagic fevers. These fevers occur infrequently and mainly in Africa, although there have been outbreaks in both Europe and the United States. The primary vector for transmission to humans is monkeys although a natural reservoir for the viruses is unknown. Primary transmission to and between humans is through direct contact with infected blood, secretions, organs, or semen, or through aerosol.

Flaviviridae include the agents that cause yellow and dengue fevers (both mosquito borne), Kyasanur Forest disease, and Omsk hemorrhagic fever (both tick borne).

It is presumed that these agents may be used in a bioterrorist event, although there is no direct evidence. These agents have a high infectivity rate when aerosolized and some are highly lethal.

Viral hemorrhagic fevers is transmissible between persons, especially when an infected person has a cough, hemorrhage, vomiting or diarrhea.

CLINICAL MANIFESTATION

Incubation period for the VHF viruses range from 4-21 days depending upon the agent involved. Also, the clinical presentation may differ slightly from agent to agent and may allow for a more specific diagnosis although a definitive diagnosis should be made based on laboratory results and electron microscopy.

The vascular bed is the target organ in VHF syndrome. Symptoms that are generally common among most hemorrhagic fevers are fever, myalgias, prostration, hypotension, flushing, petechial hemorrhages, and conjunctiva injection. If the syndrome progresses to being full blown, shock and mucous membrane hemorrhage may evolve. There may also be neurological involvement. Clinical features of some specific agents are:

- Hepatic involvement and jaundice: RVF, CCHF, Marburg and Ebola, and yellow fever.
- Pulmonary involvement and a biphasic illness with CNS involvement: Kyasanur Forest disease and Omsk HF.
- Lassa fever: severe peripheral edema without hemorrhage, and hearing loss in survivors.
- CCHF: severe hemorrhage and nosocomial transmission.
- RVF: retinitis.

Hantavirus infection has a severe infection course progressing from fever through hemorrhage, shock, renal failure, and polyuria. There may also be myalgias, abdominal pain and oliguria without shock or severe hemorrhagic features due to nephropathia endemica. In North America, cases of Hantavirus Pulmonary Syndrome lack renal failure and hemorrhagic features, but have a high mortality due to severe pulmonary capillary leak.

There may also be evidence of additional organ system involvement including headache, nausea, vomiting, diarrhea or constipation, abdominal pain, dizziness, confusion, tremor, cough, photophobia, or pharyngitis. These symptoms do not dominate the clinical picture.

Mortality for all VHF is variable, ranging up to 90% for Ebola HF patients.

DIAGNOSIS

All laboratory work should be performed in a Biosafety Level 3 or 4 facility due to the high probability of aerosolization in the lab.

A preliminary diagnosis should be based on a high level of suspicion that includes a detailed travel history. Also, it should be noted if rodents or rodent excrement were seen by the patient during or immediately prior to the incubation period of the disease. Actual contact with the rodents or droppings are not necessary due to the possible aerosolization of the viruses.

A definitive diagnosis should be made on virologic diagnosis. With the exception of hantaviral infections, evidence of viremia will be present in most patients. Rapid enzyme immunoassays are available to detect viral antigens in sera from patients with Argentine HF, CCHF, yellow fever, Lassa fever, and RFV. During the acute phase of illness Lassa and Hantaan-specific IgM are detectable.

All laboratory specimens should be double bagged. In addition, the exterior bag should be decontaminated prior to sending.

Cultivation, diagnosis and identification of these viruses will take at least 3 to 10 days and should be carried out at laboratories at the CDC or USAMRIID.

ISOLATION / DECONTAMINATION

Standard precautions are required in all cases of VHF in order to minimize the opportunity for nosocomial transmission. Due to the large amount of blood loss that may occur in patients with VHF, special caution should be given to the disposal of sharps materials to prevent perenteral exposure.

Lassa virus, CCHF, Ebola, and Marburg require special attention to prevent nosocomial transmission by aerosol. Patients with these conditions should be placed in a private room, and, if possible, an adjoining anteroom should be used if available for storage of supplies, putting on and removing protective barriers, and for preliminary decontamination of waste and lab specimen containers. All persons who enter the room of these patients should be wearing gloves and gowns. If the person will be coming within three feet of these patients, face shields or surgical masks are required. If the patient has discharge that could aerosolize the virus (cough, vomiting, diarrhea, hemorrhage), airborne isolation should be used including a respirator with HEPA filter, battery powered air purifier, or positive pressure supplied air.

All contaminated material should be decontaminated by autoclaving or the application of hypochlorite or phenolic solutions.

Personnel in the clinical laboratory may be at risk due to aerosolization of the virus. Therefore, a biosafety cabinet and barrier precautions should be employed when handling specimens.

Autopsy/Handling of Corpses: If a patient dies, the body should be sealed in leak-proof material and promptly buried or cremated. Minimal handling of the body should occur. All persons participating in autopsies must wear mandated personal protective equipment as described by OSHA guidelines. All instruments used in an autopsy should be autoclaved or sterilized using a 10% bleach or other approved solution. Contaminated surfaces should be decontaminated with appropriate germicides such as 10% hypochlorite, 5% phenol, or iodine.

TREATMENT / PROPHYLAXIS

Supportive care is the primary treatment for patients with VHF regardless of the etiologic agent involved. All invasive procedures should be carefully considered for potential benefit over risk of hemorrhage. Sedatives and analgesics should be used judiciously. Avoid the use of intramuscular injections, aspirin, and other anticoagulant drugs.

The investigational antiviral drug Ribavirin has shown some benefits in cases of Lassa fever, Hantavirus infections, CCHF, and RVF. Ribavirin is teratogenic in laboratory animals, and a benefits versus risk analysis should be done in pregnant patients. For the protocol on the use of Ribavirin in these cases, contact the CDC.

Persons with mucocutaneous or percutaneous exposure to blood or body fluids from a patient should wash the affected areas immediately with soap and water. If a mucous membrane is exposed, it should be irrigated with copious amounts of saline or water. The exposed person should be carefully monitored for symptoms of VHF.

VACCINE

Yellow fever is the only VHF with a licensed vaccine currently available for use. This vaccine is mandatory for persons traveling to endemic areas of South America and Africa. Investigational vaccines are also being developed for Argentine HF, RVF, and Hantaan viruses.

Viral Hemorrhagic Fever – Frequently Asked Questions (FAQ)

What is VHF?

VHF are diseases that are caused by several different families of viruses. These viruses may be intentionally released into the air (bioterrorism) and breathed (inhaled). These viruses can also enter the body by way of open cuts or sores on the skin or by contacting the eyes.

Can I get VHF from an infected person?

The infection is transmissible from person to person. Some of the viruses that cause VHF are more infectious than others. If you know someone who is infected with VHF, you should avoid having contact with them until you know they are well, unless you are providing care for them.

How will I know if I was exposed to the virus?

It will depend on how the virus is released, where it was released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start from 4-21 days after exposure to the virus, depending on what virus is causing illness.

What are the symptoms of infection?

Symptoms of the disease are very nonspecific and vary depending on the virus that is causing illness. Common symptoms of the disease are fever, headache, muscle aches, and fatigue. There may also be respiratory (breathing) and/or neurological involvement depending on the virus that is causing disease.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will put you in the hospital so that proper care can be administered.

How is the infection prevented?

If you believe you were exposed to the virus, you should immediately notify your health care provider (doctor or nurse). If you develop symptoms of the disease, go to your nearest hospital or emergency room immediately.

What should I do if I DO NOT have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please DO NOT go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

<p>This fact sheet is recommended for public release.</p>
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HOME CARE INSTRUCTIONS VIRAL HEMMORHAGIC FEVERS

In the event of an intentional release of the organism that causes Viral Hemmorrhagic Fever, many people may require hospitalization within a few days of exposure. Hospitals may quickly become overwhelmed and unable to take care of every person who seeks treatment. For this reason, some sick people may have to be cared for in their home by relatives or friends. The following information may be helpful to those providing care to the sick.

- Advise friends and relatives not to visit.
- Wear a mask when you are in close contact with a sick person who is coughing or bleeding from anywhere.
- Wear a plastic gown or apron to protect your clothes from becoming soiled with blood or other bodily fluids.
- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after you have contact with the sick individual.
- Wear vinyl or latex gloves when you have the potential to contact the sick person's blood or other bodily fluid (urine, feces, vomit, wound drainage, mucous, saliva). Wash your hands with soap and water after removing the gloves. If gloves are not available, wash your hands with soap and water after contact with the sick person's blood or other bodily fluids.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- After the sick person uses the toilet, or after pouring blood or other bodily fluids down the toilet, pour 1 cup of household bleach into the toilet, wait 5 minutes, and then flush the toilet.
- Take the person's temperature at least two times a day. If the temperature rises about 100° F give Tylenol or other medicine such as Motrin or Advil. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, seek medical advice or take the person to the nearest designated emergency center or hospital.
- If the person develops breathing problems, go immediately to the nearest designated emergency center or hospital.
- Give the sick person plenty of fluids such as water and juice. Allow the person to eat solid food as it is tolerated.
- Change the sick person's clothing and bed linens often, especially if they become soiled with blood or bodily fluids. Wear a mask, a plastic gown or apron, and gloves if the linen is soiled with blood or other bodily fluid.
- Wash soiled clothing and bed linens in hot water using any commercial laundry soap.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol every day or when surfaces become soiled with blood or bodily fluids.
- As a caregiver, take good care of yourself. Get plenty of rest, drink plenty of fluids, and eat a healthy diet. Even if you are not taking an antibiotic, take your own temperature in the morning and afternoon for one month. If you develop a fever above 100° F or if you have flu-like symptoms, seek medical attention immediately.

Please listen to local radio or television stations for continual updates on this public health emergency.

Sedgwick County Health Department and other agencies will be providing follow-up visits and support in the next few days.

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CDC STANDARD AND CONTACT PRECAUTIONS*

Standard Precautions, as defined by the Centers for Disease Control and Prevention (CDC), are designed to reduce the risk of transmission of most disease causing microorganisms in any type of health care setting regardless of the patient's presumed or diagnosed infectious status. With the exception of smallpox, viral hemorrhagic fevers, and pneumonic plague, most infectious diseases caused by bioterrorism agents are rarely, if ever, transmitted from person-to-person. Standard Precautions should be integrated into all healthcare worker/patient care interactions that include contact with:

- Blood
- Non-intact skin
- Body fluids regardless of the presence or absence of visible blood (urine, feces, vomitus, wound and lesion drainage, pulmonary secretions including nasal and salivary secretions and tears)
- Skin soiled with visible blood or other body fluids
- Mucous membranes

The following diseases require Standard Precautions to reduce the risk of transmission to health care workers.

Bioterrorism Diseases

- *Bacillus anthracis* – Anthrax (See contact Precautions)
- *Brucellae* species – Brucellosis
- *Clostridium Botulinum* - Botulism
- *Coxiella burnetii* - Q fever
- *Francisella tularensis* – Tularemia (See Contact Precautions)

OSHA Blood borne Pathogens Standard

Healthcare workers should follow facility specific policies and procedures related to reducing the risk of occupational exposure to blood and other potentially infectious materials as required by the California Occupational Safety and Health Administration's (CAL-OSHA) Blood borne Pathogens Standard.

Patient Placement

Place patients in any available bed on any nursing unit. Patients with similar syndromes may also be cohorted (grouped) in semi-private or multiple-bed rooms. Special

* This guideline is not intended to replace facility specific policies and procedures.

ventilation is not required. Consider placing patients who frequently contaminate the immediate environment with blood or body fluids (e.g., incontinence, wound drainage not contained by a dressing or poor hygienic habits) in a private room.

Visitors

Limit visitors to immediate family members and significant others. Instruct visitors to wash their hands before and after patient contact and before leaving the patient's room.

Personal Protective Equipment (PPE)

Gloves

Wear disposable gloves when contact with blood and body fluids is anticipated. Gloves should also be worn when touching environmental surfaces and patient care articles likely to be contaminated or soiled with blood or body fluids. Gloves should be put on just prior to performing a patient care task that involves contact with blood or body fluids and removed immediately, without touching non-contaminated surfaces, when the task is complete. When performing multiple procedures on the same patient, gloves should be changed after contact with blood and body fluids that contain high concentrations of microorganisms (e.g., feces, wound drainage or oropharyngeal secretions) and before contact with a clean body site such as non-intact skin and vascular access sites.

Facial Protection

Wear disposable, fluid-resistant masks and eye shields (goggles with side-shields) or a face shield when performing patient care tasks likely to generate splashing or spraying of blood and body fluids onto the mucous membranes of the face.

Gowns

Wear disposable fluid-repelling gowns to protect skin and clothing when performing procedures likely to generate splashing or spraying of blood and body fluids. Plastic aprons may be worn for procedures likely to soil clothing but are unlikely to generate splashing or spraying of blood or body fluids (e.g., cleaning incontinent patients). The material composition of the gown should be appropriate to the amount of fluid penetration likely to be encountered. Remove soiled gowns after patient contact.

Hand washing

Wash hands promptly after contact with blood and other body fluids or with articles and surfaces contaminated or soiled with blood and body fluids regardless of whether gloves are worn. HCW should wash their hands when otherwise indicated to prevent transfer of microorganisms from one patient to another. Plain soap is sufficient for hand washing however, an antimicrobial soap should be available. Alcohol foams or gels can be used

when hand-washing facilities are not immediately accessible and if hands are not visibly soiled with blood and body fluids.

Transporting Patients

Transport patients to diagnostic services to according to facility procedure.

Laboratory Specimens

Transport specimens to the laboratory according to facility procedure.

Dietary Trays

Transport dishes and utensils to the kitchen for routine dishwashing. Disposable equipment is not necessary.

Patient Care Equipment

Equipment such as bedpans, urinals, and emesis basins should be cleaned in a manner that prevents splashing and spraying of blood and body fluids onto the healthcare workers clothing, skin and mucous membrane. Reusable equipment that requires cleaning and disinfection or sterilization should be sent to central service in covered containers for reprocessing. Disposable equipment not intended for reuse should be discarded.

Housekeeping

Clean environmental surfaces daily, when visibly soiled, and when the patient is discharged with an Environmental Protection Agency (EPA) registered disinfectant.

Soiled Linen

Place soiled linen in leak-proof bags and seal. Transport and process according to facility procedure.

Patient's Clothing

Bag patient's clothing if soiled with blood or body fluids and send home with a family member with instructions to use warm water and a commercial laundry product. If no family member is available, follow the facility procedure for washing and drying patient's clothes.

Biohazardous waste

Follow facility specific biohazardous waste management procedures.

Deceased Patient

Place the deceased patient in a leak-proof body bag and transfer to the facility morgue.

CONTACT PRECAUTIONS*

Cutaneous anthrax and tularemia, although rare, can be transmitted to healthcare workers by contact with the infected patient's wound or lesion drainage. In addition to Contact Precautions, Standard Precautions should be followed.

Patient Placement

Place the patient in a private room, if available. Patients with the same diagnosis may be cohorted (grouped) in semi-private rooms. When a private room or cohorting is not achievable, separate infected patients at least three (3) feet away from non-infected patients.

Visitors

Limit visitors to immediate family members or significant others. Instruct visitors to wash their hands before and after patient contact and before leaving the patient's room.

Patient's Clothing

Bag patient's clothing and send home with a family member. Instruct family members to wear gloves when handling clothes soiled with wound or lesion drainage. Clothes should be washed in warm or hot water using a commercial laundry product. If no family member is available, follow the facility procedure for washing and drying patient's clothing.

* This guideline is not intended to replace facility specific policies and procedures.

Recommendations for Isolation Precautions in Hospitals

Hospital Infection Control Practices Advisory Committee

RATIONALE FOR ISOLATION PRECAUTIONS IN HOSPITALS

Transmission of infection within a hospital requires three elements: a source of infecting microorganisms, a susceptible host, and a means of transmission for the microorganism.

Source

Human sources of the infecting microorganisms in hospitals may be patients, personnel, or, on occasion, visitors, and may include persons with acute disease, persons in the incubation period of a disease, persons who are colonized by an infectious agent but have no apparent disease, or persons who are chronic carriers of an infectious agent. Other sources of infecting microorganisms can be the patient's own endogenous flora, which may be difficult to control, and inanimate environmental objects that have become contaminated, including equipment and medications.

Host

Resistance among persons to pathogenic microorganisms varies greatly. Some persons may be immune to infection or may be able to resist colonization by an infectious agent; others exposed to the same agent may establish a commensal relationship with the infecting microorganism and become asymptomatic carriers; still others may develop clinical disease. Host factors such as age; underlying diseases; certain treatments with antimicrobials, corticosteroids, or other immunosuppressive agents; irradiation; and breaks in the first line of defense mechanisms caused by such factors as surgical operations, anesthesia, and indwelling catheters may render patients more susceptible to infection.

Transmission

Microorganisms are transmitted in hospitals by several routes, and the same microorganism may be transmitted by more than one route. There are five main routes of transmission: contact, droplet, airborne, common vehicle, and vectorborne. For the purpose of this guideline, common vehicle and vectorborne transmission will be discussed only briefly, because neither play a significant role in typical nosocomial infections.

- (1) *Contact transmission*, the most important and frequent mode of transmission of nosocomial infections, is divided into two subgroups: direct-contact transmission and indirect-contact transmission.
 - (a) Direct-contact transmission involves a direct body surface-to-body surface contact and physical transfer of microorganisms between a susceptible host and an infected or colonized person, such as occurs when a person turns a patient, gives a patient a bath, or performs other patient-care activities that require direct personal contact. Direct-contact transmission also can occur between two patients, with one serving as the source of the infectious microorganisms and the other as a susceptible host.
 - (b) Indirect-contact transmission involves contact of a susceptible host with a contaminated intermediate object, usually inanimate, such as contaminated instruments, needles, or dressings, or contaminated hands that are not washed and gloves that are not changed between patients.

- (2) *Droplet transmission*, theoretically, is a form of contact transmission. However, the mechanism of transfer of the pathogen to the host is quite distinct from either direct- or indirect-contact transmission. Therefore, droplet transmission will be considered a separate route of transmission in this guideline. Droplets are generated from the source person primarily during coughing, sneezing, and talking, and during the performance of certain procedures such as suctioning and bronchoscopy. Transmission occurs when droplets containing microorganisms generated from the infected person are propelled a short distance through the air and deposited on the host's conjunctivae, nasal mucosa, or mouth. Because droplets do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission; that is, droplet transmission *must not* be confused with airborne transmission.
- (3) *Airborne transmission* occurs by dissemination of either airborne droplet nuclei (small-particle residue [5 µm or smaller in size] of evaporated droplets containing microorganisms that remain suspended in the air for long periods of time) or dust particles containing the infectious agent. Microorganisms carried in this manner can be dispersed widely by air currents and may become inhaled by a susceptible host within the same room or over a longer distance from the source patient, depending on environmental factors; therefore, special air handling and ventilation are required to prevent airborne transmission. Microorganisms transmitted by airborne transmission include *Mycobacterium tuberculosis* and the rubeola and varicella viruses.
- (4) *Common vehicle transmission* applies to microorganisms transmitted by contaminated items such as food, water, medications, devices, and equipment.
- (5) *Vectorborne transmission* occurs when vectors such as mosquitoes, flies, rats, and other vermin transmit microorganisms; this route of transmission is of less significance in hospitals in the United States than in other regions of the world.

Isolation precautions are designed to prevent transmission of microorganisms by these routes in hospitals. Because agent and host factors are more difficult to control, interruption of transfer of microorganisms is directed primarily at transmission. The recommendations presented in this guideline are based on this concept.

Placing a patient on isolation precautions, however, often presents certain disadvantages to the hospital, patients, personnel, and visitors. Isolation precautions may require specialized equipment and environmental modifications that add to the cost of hospitalization. Isolation precautions may make frequent visits by nurses, physicians, and other personnel inconvenient, and they may make it more difficult for personnel to give the prompt and frequent care that sometimes is required. The use of a multi-patient room for one patient uses valuable space that otherwise might accommodate several patients. Moreover, forced solitude deprives the patient of normal social relationships and may be psychologically harmful, especially to children. These disadvantages, however, must be weighed against the hospital's mission to prevent the spread of serious and epidemiologically important microorganisms in the hospital.

FUNDAMENTALS OF ISOLATION PRECAUTIONS

A variety of infection control measures are used for decreasing the risk of transmission of microorganisms in hospitals. These measures make up the fundamentals of isolation precautions.

Hand washing and Gloving

Hand washing frequently is called the single most important measure to reduce the risks of transmitting organisms from one person to another or from one site to another on the same patient. The scientific rationale, indications, methods, and products for hand washing have been delineated in other publications.(64-72)

Washing hands as promptly and thoroughly as possible between patient contacts and after contact with blood, body fluids, secretions, excretions, and equipment or articles contaminated by them is an important component of infection control and isolation precautions. In addition to hand washing, gloves play an important role in reducing the risks of transmission of microorganisms.

Gloves are worn for three important reasons in hospitals. First, gloves are worn to provide a protective barrier and to prevent gross contamination of the hands when touching blood, body fluids, secretions, excretions, mucous membranes, and nonintact skin (27-29); the wearing of gloves in specified circumstances to reduce the risk of exposures to blood borne pathogens is mandated by the OSHA blood borne pathogens final rule.(51) Second, gloves are worn to reduce the likelihood that microorganisms present on the hands of personnel will be transmitted to patients during invasive or other patient-care procedures that involve touching a patient's mucous membranes and nonintact skin. Third, gloves are worn to reduce the likelihood that hands of personnel contaminated with microorganisms from a patient or a fomite can transmit these microorganisms to another patient. In this situation, gloves must be changed between patient contacts and hands washed after gloves are removed.

Wearing gloves does not replace the need for hand washing, because gloves may have small, unapparent defects or may be torn during use, and hands can become contaminated during removal of gloves.(14,15,39,72-76) Failure to change gloves between patient contacts is an infection control hazard.(32)

Patient Placement

Appropriate patient placement is a significant component of isolation precautions. A private room is important to prevent direct- or indirect-contact transmission when the source patient has poor hygienic habits, contaminates the environment, or cannot be expected to assist in maintaining infection control precautions to limit transmission of microorganisms (i.e., infants, children, and patients with altered mental status). When possible, a patient with highly transmissible or epidemiologically important microorganisms is placed in a private room with hand washing and toilet facilities, to reduce opportunities for transmission of microorganisms.

When a private room is not available, an infected patient is placed with an appropriate roommate. Patients infected by the same microorganism usually can share a room, provided they are not infected with other potentially transmissible microorganisms and the likelihood of reinfection with the same organism is minimal. Such sharing of rooms, also referred to as cohorting patients, is useful especially during outbreaks or when there is a shortage of private rooms. When a private room is not available and cohorting is not achievable or recommended,(23) it is very important to consider the epidemiology and

mode of transmission of the infecting pathogen and the patient population being served in determining patient placement. Under these circumstances, consultation with infection control professionals is advised before patient placement. Moreover, when an infected patient shares a room with a noninfected patient, it also is important that patients, personnel, and visitors take precautions to prevent the spread of infection and that roommates are selected carefully.

Guidelines for construction, equipment, air handling, and ventilation for isolation rooms have been delineated in other publications.(77-79) A private room with appropriate air handling and ventilation is particularly important for reducing the risk of transmission of microorganisms from a source patient to susceptible patients and other persons in hospitals when the microorganism is spread by airborne transmission. Some hospitals use an isolation room with an anteroom as an extra measure of precaution to prevent airborne transmission. Adequate data regarding the need for an anteroom, however, is not available. Ventilation recommendations for isolation rooms housing patients with pulmonary tuberculosis have been delineated in other CDC guidelines.(23)

Transport of Infected Patients

Limiting the movement and transport of patients infected with virulent or epidemiologically important microorganisms and ensuring that such patients leave their rooms only for essential purposes reduces opportunities for transmission of microorganisms in hospitals. When patient transport is necessary, it is important that 1) appropriate barriers (e.g., masks, impervious dressings) are worn or used by the patient to reduce the opportunity for transmission of pertinent microorganisms to other patients, personnel, and visitors and to reduce contamination of the environment; 2) personnel in the area to which the patient is to be taken are notified of the impending arrival of the patient and of the precautions to be used to reduce the risk of transmission of infectious microorganisms; and 3) patients are informed of ways by which they can assist in preventing the transmission of their infectious microorganisms to others.

Masks, Respiratory Protection, Eye Protection, Face Shields

Various types of masks, goggles, and face shields are worn alone or in combination to provide barrier protection. A mask that covers both the nose and the mouth, and goggles or a face shield are worn by hospital personnel during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions to provide protection of the mucous membranes of the eyes, nose, and mouth from contact transmission of pathogens. The wearing of masks, eye protection, and face shields in specified circumstances to reduce the risk of exposures to blood borne pathogens is mandated by the OSHA blood borne pathogens final rule.(51) A surgical mask generally is worn by hospital personnel to provide protection against spread of infectious large-particle droplets that are transmitted by close contact and generally travel only short distances (up to 3 ft) from infected patients who are coughing or sneezing.

An area of major concern and controversy over the last several years has been the role and selection of respiratory protection equipment and the implications of a respiratory protection program for prevention of transmission of tuberculosis in hospitals. Traditionally, although the efficacy was not proven, a surgical mask was worn for isolation precautions in hospitals when patients were known or suspected to be infected with pathogens spread by the airborne route of transmission. In 1990, however, the CDC tuberculosis guidelines (18) stated that surgical masks may not be effective in preventing

the inhalation of droplet nuclei and recommended the use of disposable particulate respirators, despite the fact that the efficacy of particulate respirators in protecting persons from the inhalation of *M tuberculosis* had not been demonstrated. By definition, particulate respirators included dust-mist (DM), dust-fume-mist (DFM), or high-efficiency particulate air (HEPA) filter respirators certified by the CDC National Institute for Occupational Safety and Health (NIOSH); because the generic term "particulate respirator" was used in the 1990 guidelines, the implication was that any of these respirators provided sufficient protection.(80)

In 1993, a draft revision of the CDC tuberculosis guidelines (22) outlined performance criteria for respirators and stated that some DM or DFM respirators might not meet these criteria. After review of public comments, the guidelines were finalized in October 1994,(23) with the draft respirator criteria unchanged. At that time, the only class of respirators that were known to consistently meet or exceed the performance criteria outlined in the 1994 tuberculosis guidelines and that were certified by NIOSH (as required by OSHA) were HEPA filter respirators. Subsequently, NIOSH revised the testing and certification requirements for all types of air-purifying respirators, including those used for tuberculosis control.(81) The new rule, effective in July 1995, provides a broader range of certified respirators that meet the performance criteria recommended by CDC in the 1994 tuberculosis guidelines. NIOSH has indicated that the N95 (N category at 95% efficiency) meets the CDC performance criteria for a tuberculosis respirator. The new respirators are likely to be available in late 1995. Additional information on the evolution of respirator recommendations, regulations to protect hospital personnel, and the role of various federal agencies in respiratory protection for hospital personnel has been published.(80)

Gowns and Protective Apparel

Various types of gowns and protective apparel are worn to provide barrier protection and to reduce opportunities for transmission of microorganisms in hospitals. Gowns are worn to prevent contamination of clothing and to protect the skin of personnel from blood and body fluid exposures. Gowns especially treated to make them impermeable to liquids, leg coverings, boots, or shoe covers provide greater protection to the skin when splashes or large quantities of infective material are present or anticipated. The wearing of gowns and protective apparel under specified circumstances to reduce the risk of exposures to blood borne pathogens is mandated by the OSHA blood borne pathogens final rule.(51)

Gowns are also worn by personnel during the care of patients infected with epidemiologically important microorganisms to reduce the opportunity for transmission of pathogens from patients or items in their environment to other patients or environments; when gowns are worn for this purpose, they are removed before leaving the patient's environment and hands are washed. Adequate data regarding the efficacy of gowns for this purpose, however, is not available.

Patient-Care Equipment and Articles

Many factors determine whether special handling and disposal of used patient-care equipment and articles are prudent or required, including the likelihood of contamination with infective material; the ability to cut, stick, or otherwise cause injury (needles, scalpels, and other sharp instruments [sharps]); the severity of the associated disease; and the environmental stability of the pathogens involved.(27,51,82-84) Some used articles are enclosed in containers or bags to prevent inadvertent exposures to patients, personnel,

and visitors and to prevent contamination of the environment. Used sharps are placed in puncture-resistant containers; other articles are placed in a bag. One bag is adequate if the bag is sturdy and the article can be placed in the bag without contaminating the outside of the bag (85); otherwise, two bags are used.

The scientific rationale, indications, methods, products, and equipment for reprocessing patient-care equipment have been delineated in other publications.(68,84,86-91) Contaminated, reusable critical medical devices or patient-care equipment (i.e., equipment that enters normally sterile tissue or through which blood flows) or semi critical medical devices or patient-care equipment (i.e., equipment that touches mucous membranes) are sterilized or disinfected (reprocessed) after use to reduce the risk of transmission of microorganisms to other patients; the type of reprocessing is determined by the article and its intended use, the manufacturer's recommendations, hospital policy, and any applicable guidelines and regulations.

Noncritical equipment (i.e., equipment that touches intact skin) contaminated with blood, body fluids, secretions, or excretions is cleaned and disinfected after use, according to hospital policy. Contaminated disposable (single-use) patient-care equipment is handled and transported in a manner that reduces the risk of transmission of microorganisms and decreases environmental contamination in the hospital; the equipment is disposed of according to hospital policy and applicable regulations.

Linen and Laundry

Although soiled linen may be contaminated with pathogenic microorganisms, the risk of disease transmission is negligible if it is handled, transported, and laundered in a manner that avoids transfer of microorganisms to patients, personnel, and environments. Rather than rigid rules and regulations, hygienic and common sense storage and processing of clean and soiled linen are recommended.(27,83,92,93) The methods for handling, transporting, and laundering of soiled linen are determined by hospital policy and any applicable regulations.

Dishes, Glasses, Cups, and Eating Utensils

No special precautions are needed for dishes, glasses, cups, or eating utensils. Either disposable or reusable dishes and utensils can be used for patients on isolation precautions. The combination of hot water and detergents used in hospital dishwashers is sufficient to decontaminate dishes, glasses, cups, and eating utensils.

Routine and Terminal Cleaning

The room, or cubicle, and bedside equipment of patients on Transmission-Based Precautions are cleaned using the same procedures used for patients on Standard Precautions, unless the infecting microorganism(s) and the amount of environmental contamination indicates special cleaning. In addition to thorough cleaning, adequate disinfection of bedside equipment and environmental surfaces (e.g., bedrails, bedside tables, carts, commodes, doorknobs, faucet handles) is indicated for certain pathogens, especially enterococci, which can survive in the inanimate environment for prolonged periods of time.(94) Patients admitted to hospital rooms that previously were occupied by patients infected or colonized with such pathogens are at increased risk of infection from contaminated environmental surfaces and bedside equipment if they have not been cleaned and disinfected adequately. The methods, thoroughness, and frequency of cleaning and the products used are determined by hospital policy.

HICPAC ISOLATION PRECAUTIONS

There are two tiers of HICPAC isolation precautions. In the first, and most important, tier are those precautions designed for the care of all patients in hospitals, regardless of their diagnosis or presumed infection status. Implementation of these "Standard Precautions" is the primary strategy for successful nosocomial infection control. In the second tier are precautions designed only for the care of specified patients. These additional "Transmission-Based Precautions" are for patients known or suspected to be infected by epidemiologically important pathogens spread by airborne or droplet transmission or by contact with dry skin or contaminated surfaces.

Standard Precautions

Standard Precautions synthesize the major features of UP (Blood and Body Fluid Precautions) (27,28) (designed to reduce the risk of transmission of blood borne pathogens) and BSI (29,30) (designed to reduce the risk of transmission of pathogens from moist body substances) and applies them to all patients receiving care in hospitals, regardless of their diagnosis or presumed infection status. Standard Precautions apply to 1) blood; 2) all body fluids, secretions, and excretions *except sweat*, regardless of whether or not they contain visible blood; 3) nonintact skin; and 4) mucous membranes. Standard Precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals.

Transmission-Based Precautions

Transmission-Based Precautions are designed for patients documented or suspected to be infected with highly transmissible or epidemiologically important pathogens for which additional precautions beyond Standard Precautions are needed to interrupt transmission in hospitals. There are three types of Transmission-Based Precautions: Airborne Precautions, Droplet Precautions, and Contact Precautions. They may be combined for diseases that have multiple routes of transmission. When used either singularly or in combination, they are to be used in addition to Standard Precautions.

Airborne Precautions are designed to reduce the risk of airborne transmission of infectious agents. Airborne transmission occurs by dissemination of either airborne droplet nuclei (small-particle residue [5 µm or smaller in size] of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles containing the infectious agent. Microorganisms carried in this manner can be dispersed widely by air currents and may become inhaled by or deposited on a susceptible host within the same room or over a longer distance from the source patient, depending on environmental factors; therefore, special air handling and ventilation are required to prevent airborne transmission. Airborne Precautions apply to patients known or suspected to be infected with epidemiologically important pathogens that can be transmitted by the airborne route.

Droplet Precautions are designed to reduce the risk of droplet transmission of infectious agents. Droplet transmission involves contact of the conjunctivae or the mucous membranes of the nose or mouth of a susceptible person with large-particle droplets (larger than 5 µm in size) containing microorganisms generated from a person who has a clinical disease or who is a carrier of the microorganism. Droplets are generated from the source person primarily during coughing, sneezing, or talking and during the performance of certain procedures such as suctioning and bronchoscopy. Transmission via large-particle droplets requires close contact between source and recipient persons, because droplets do not remain suspended in the air and generally travel only short

distances, usually 3 ft or less, through the air. Because droplets do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission. Droplet Precautions apply to any patient known or suspected to be infected with epidemiologically important pathogens that can be transmitted by infectious droplets.

Contact Precautions are designed to reduce the risk of transmission of epidemiologically important microorganisms by direct or indirect contact. Direct-contact transmission involves skin-to-skin contact and physical transfer of microorganisms to a susceptible host from an infected or colonized person, such as occurs when personnel turn patients, bathe patients, or perform other patient-care activities that require physical contact. Direct-contact transmission also can occur between two patients (e.g., by hand contact), with one serving as the source of infectious microorganisms and the other as a susceptible host. Indirect-contact transmission involves contact of a susceptible host with a contaminated intermediate object, usually inanimate, in the patient's environment. Contact Precautions apply to specified patients known or suspected to be infected or colonized (presence of microorganism in or on patient but without clinical signs and symptoms of infection) with epidemiologically important microorganisms than can be transmitted by direct or indirect contact.

A synopsis of the types of precautions and the patients requiring the precautions is listed in [Table 1](#).

EMPIRIC USE OF AIRBORNE, DROPLET, OR CONTACT PRECAUTIONS

In many instances, the risk of nosocomial transmission of infection may be highest before a definitive diagnosis can be made and before precautions based on that diagnosis can be implemented. The routine use of Standard Precautions for all patients should reduce greatly this risk for conditions other than those requiring Airborne, Droplet, or Contact Precautions. While it is not possible to prospectively identify all patients needing these enhanced precautions, certain clinical syndromes and conditions carry a sufficiently high risk to warrant the empiric addition of enhanced precautions while a more definitive diagnosis is pursued. A listing of such conditions and the recommended precautions beyond Standard Precautions is presented in [Table 2](#).

The organisms listed under the column "Potential Pathogens" are not intended to represent the complete or even most likely diagnoses, but rather possible etiologic agents that require additional precautions beyond Standard Precautions until they can be ruled out. Infection control professionals are encouraged to modify or adapt this table according to local conditions. To ensure that appropriate empiric precautions are implemented always, hospitals must have systems in place to evaluate patients routinely, according to these criteria as part of their preadmission and admission care.

IMMUNOCOMPROMISED PATIENTS

Immunocompromised patients vary in their susceptibility to nosocomial infections, depending on the severity and duration of immunosuppression. They generally are at increased risk for bacterial, fungal, parasitic, and viral infections from both endogenous and exogenous sources. The use of Standard Precautions for all patients and Transmission-Based Precautions for specified patients, as recommended in this guideline,

should reduce the acquisition by these patients of institutionally acquired bacteria from other patients and environments.

It is beyond the scope of this guideline to address the various measures that may be used for immunocompromised patients to delay or prevent acquisition of potential pathogens during temporary periods of neutropenia. Rather, the primary objective of this guideline is to prevent transmission of pathogens from infected or colonized patients in hospitals. Users of this guideline, however, are referred to the "Guideline for Prevention of Nosocomial Pneumonia" (95,96) for the HICPAC recommendations for prevention of nosocomial aspergillosis and Legionnaires' disease in immunocompromised patients.

RECOMMENDATIONS

The recommendations presented below are categorized as follows:

Category IA. Strongly recommended for all hospitals and strongly supported by well-designed experimental or epidemiologic studies.

Category IB. Strongly recommended for all hospitals and reviewed as effective by experts in the field and a consensus of HICPAC based on strong rationale and suggestive evidence, even though definitive scientific studies have not been done.

Category II. Suggested for implementation in many hospitals. Recommendations may be supported by suggestive clinical or epidemiologic studies, a strong theoretical rationale, or definitive studies applicable to some, but not all, hospitals.

No recommendation; unresolved issue. Practices for which insufficient evidence or consensus regarding efficacy exists.

The recommendations are limited to the topic of isolation precautions. Therefore, they must be supplemented by hospital policies and procedures for other aspects of infection and environmental control, occupational health, administrative and legal issues, and other issues beyond the scope of this guideline.

I. Administrative Controls

A. Education

Develop a system to ensure that hospital patients, personnel, and visitors are educated about use of precautions and their responsibility for adherence to them. *Category IB*

B. Adherence to Precautions

Periodically evaluate adherence to precautions, and use findings to direct improvements. *Category IB*

II. Standard Precautions

Use Standard Precautions, or the equivalent, for the care of all patients. *Category IB*

A. Hand washing

(1) Wash hands after touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Wash hands immediately after gloves are removed, between patient contacts, and when otherwise indicated to avoid transfer of microorganisms to other patients or environments. It may be necessary to wash hands between tasks and procedures on the same patient to prevent cross-contamination of different body sites. *Category IB*

(2) Use a plain (nonantimicrobial) soap for routine hand washing. *Category IB*

(3) Use an antimicrobial agent or a waterless antiseptic agent for specific circumstances (e.g., control of outbreaks or hyperendemic infections), as defined by the infection control program. *Category IB* (See Contact Precautions for additional recommendations on using antimicrobial and antiseptic agents.)

B. Gloves

Wear gloves (clean, nonsterile gloves are adequate) when touching blood, body fluids, secretions, excretions, and contaminated items. Put on clean gloves just before touching mucous membranes and nonintact skin. Change gloves between tasks and procedures on the same patient after contact with material that may contain a high concentration of microorganisms. Remove gloves promptly after use, before touching noncontaminated items and environmental surfaces, and before going to another patient, and wash hands immediately to avoid transfer of microorganisms to other patients or environments. *Category IB*

C. Mask, Eye Protection, Face Shield

Wear a mask and eye protection or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions. *Category IB*

D. Gown

Wear a gown (a clean, nonsterile gown is adequate) to protect skin and to prevent soiling of clothing during procedures and patient-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Select a gown that is appropriate for the activity and amount of fluid likely to be encountered. Remove a soiled gown as promptly as possible, and wash hands to avoid transfer of microorganisms to other patients or environments. *Category IB*

E. Patient-Care Equipment

Handle used patient-care equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients and environments. Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and reprocessed appropriately. Ensure that single-use items are discarded properly. *Category IB*

F. Environmental Control

Ensure that the hospital has adequate procedures for the routine care, cleaning, and disinfection of environmental surfaces, beds, bedrails, bedside equipment, and other frequently touched surfaces, and ensure that these procedures are being followed. *Category IB*

G. Linen

Handle, transport, and process used linen soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures and contamination of clothing, and that avoids transfer of microorganisms to other patients and environments. *Category IB*

H. Occupational Health and Blood borne Pathogens

(1) Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Never recap used needles, or otherwise manipulate them using both hands, or use any other technique that involves directing the point of a needle toward any part of the body; rather, use either a one-handed "scoop" technique or a mechanical device designed for holding the needle sheath. Do not remove used needles from disposable syringes by hand, and do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in appropriate puncture-resistant containers, which are located as close as practical to the area in which the items were used, and place reusable syringes and needles in a puncture-resistant container for transport to the reprocessing area. *Category IB*

(2) Use mouthpieces, resuscitation bags, or other ventilation devices as an alternative to mouth-to-mouth resuscitation methods in areas where the need for resuscitation is predictable. *Category IB*

I. Patient Placement

Place a patient who contaminates the environment or who does not (or cannot be expected to) assist in maintaining appropriate hygiene or environmental control in a private room. If a private room is not available, consult with infection control professionals regarding patient placement or other alternatives. *Category IB*

III. Airborne Precautions

In addition to Standard Precautions, use Airborne Precautions, or the equivalent, for patients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei (small-particle residue [5 µm or smaller in size] of evaporated droplets containing microorganisms that remain suspended in the air and that can be dispersed widely by air currents within a room or over a long distance). *Category IB*

A. Patient Placement

Place the patient in a private room that has 1) monitored negative air pressure in relation to the surrounding areas, 2) 6 to 12 air changes per hour, and 3) appropriate discharge of air outdoors or monitored high-efficiency filtration of room air before the air is circulated to other areas in the hospital.(23) Keep the room door closed and the patient in the room. When a private room is not available, place the patient in a room with a patient who has active infection with the same microorganism, unless otherwise recommended,(23) but with no other infection. When a private room is not available and cohorting is not desirable, consultation with infection control professionals is advised before patient placement. *Category IB*

B. Respiratory Protection

Wear respiratory protection (N95 respirator) when entering the room of a patient with known or suspected infectious pulmonary tuberculosis.(23,81) Susceptible persons should not enter the room of patients known or suspected to have measles (rubeola) or varicella (chickenpox) if other immune caregivers are available. If susceptible persons must enter the room of a patient known or suspected to have measles (rubeola) or

varicella, they should wear respiratory protection (N95 respirator).(81) Persons immune to measles (rubeola) or varicella need not wear respiratory protection.
Category IB

C. Patient Transport

Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient, if possible. *Category IB*

D. Additional Precautions for Preventing Transmission of Tuberculosis

Consult CDC "Guidelines for Preventing the Transmission of Tuberculosis in Health-Care Facilities"(23) for additional prevention strategies.

IV. Droplet Precautions

In addition to Standard Precautions, use Droplet Precautions, or the equivalent, for a patient known or suspected to be infected with microorganisms transmitted by droplets (large-particle droplets [larger than 5 µm in size] that can be generated by the patient during coughing, sneezing, talking, or the performance of procedures).
Category IB

A. Patient Placement

Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s) who has active infection with the same microorganism but with no other infection (cohorting). When a private room is not available and cohorting is not achievable, maintain spatial separation of at least 3 ft between the infected patient and other patients and visitors. Special air handling and ventilation are not necessary, and the door may remain open. *Category IB*

B. Mask

In addition to wearing a mask as outlined under Standard Precautions, wear a mask when working within 3 ft of the patient. (Logistically, some hospitals may want to implement the wearing of a mask to enter the room.) *Category IB*

C. Patient Transport

Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplets by masking the patient, if possible. *Category IB*

V. Contact Precautions

In addition to Standard Precautions, use Contact Precautions, or the equivalent, for specified patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by direct contact with the patient (hand or skin-to-skin contact that occurs when performing patient-care activities that require touching the patient's dry skin) or indirect contact (touching) with environmental surfaces or patient-care items in the patient's environment. *Category IB*

A. Patient Placement

Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s) who has active infection with the same

microorganism but with no other infection (cohorting). When a private room is not available and cohorting is not achievable, consider the epidemiology of the microorganism and the patient population when determining patient placement. Consultation with infection control professionals is advised before patient placement.

Category IB

B. Gloves and Hand washing

In addition to wearing gloves as outlined under Standard Precautions, wear gloves (clean, nonsterile gloves are adequate) when entering the room. During the course of providing care for a patient, change gloves after having contact with infective material that may contain high concentrations of microorganisms (fecal material and wound drainage). Remove gloves before leaving the patient's room and wash hands immediately with an antimicrobial agent or a waterless antiseptic agent.(72,94) After glove removal and hand washing, ensure that hands do not touch potentially contaminated environmental surfaces or items in the patient's room to avoid transfer of microorganisms to other patients or environments. *Category IB*

C. Gown

In addition to wearing a gown as outlined under Standard Precautions, wear a gown (a clean, nonsterile gown is adequate) when entering the room if you anticipate that your clothing will have substantial contact with the patient, environmental surfaces, or items in the patient's room, or if the patient is incontinent or has diarrhea, an ileostomy, a colostomy, or wound drainage not contained by a dressing. Remove the gown before leaving the patient's environment. After gown removal, ensure that clothing does not contact potentially contaminated environmental surfaces to avoid transfer of microorganisms to other patients or environments. *Category IB*

D. Patient Transport

Limit the movement and transport of the patient from the room to essential purposes only. If the patient is transported out of the room, ensure that precautions are maintained to minimize the risk of transmission of microorganisms to other patients and contamination of environmental surfaces or equipment. *Category IB*

E. Patient-Care Equipment

When possible, dedicate the use of noncritical patient-care equipment to a single patient (or cohort of patients infected or colonized with the pathogen requiring precautions) to avoid sharing between patients. If use of common equipment or items is unavoidable, then adequately clean and disinfect them before use for another patient. *Category IB*

F. Additional Precautions for Preventing the Spread of Vancomycin Resistance

Consult the HICPAC report on preventing the spread of vancomycin resistance for additional prevention strategies.(94)

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Updated: February 18, 1997